

Amendments
To
The Water Quality Control Plan For The
Sacramento River and San Joaquin River
Basins

For
Beneficial Uses At
West Squaw Creek
Shasta County
Draft Final Staff Report

Appendix D

Response to Public Comments On
April 2004 Draft Staff Report and Use Attainability
Analysis

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RESPONSE TO COMMENTS, PROPOSED BASIN PLAN AMENDMENTS FOR WEST SQUAW CREEK, SHASTA COUNTY

Comments of California Department of Fish and Game (Mr. Donald B. Koch)

The California Department of Fish and Game (CDFG) submitted comments dated 26 March to the Regional Water Quality Control Board, Central Valley Region (Regional Board) on the proposed amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), and associated draft Staff Report and draft Use Attainability Analysis. These responses will address those comments.

CDFG's comments are presented in *italics* below with Regional Board responses immediately following

1. *Mining Remedial Recovery Company, Inc (MRRC), will remain responsible for monitoring and maintaining the existing remedial facilities, complying with National Pollutant Discharge Elimination System (NPDES) permits to protect remaining designated beneficial uses in West Squaw Creek and the uses of downstream water bodies and continue to implement point and non point source "Best Management Practices " (BMPs).*

The Regional Board will continue to regulate the discharges of acid rock drainage from the abandoned mines in West Squaw Creek owned by MRRC through the NPDES program. The NPDES permit currently, and will in the future, require MRRC to continue to maintain current BMPs and implement new BMPs if and when new technology becomes available. The Resolution to the Regional Board containing the proposed Basin Plan Amendment contains language assuring continued regulation of the mines and to assure no backsliding occurs.

2. *MRRC will focus its resources on reducing metal loading from larger more significant sources of metal discharges to Little Backbone Creek and Spring Creek which will allow for greater overall reduction in metal loading to Shasta Lake and the Sacramento River.*

MRRC owns mines in both the Little Backbone Creek and Spring Creek watersheds. Currently, the majority of the metal loading to Shasta Lake is from Little Backbone Creek. These mines are also regulated by the NPDES permit. Monitoring data has identified several areas where large sources of acid rock drainage originate in Little Backbone Creek. These sources will be the focus of MRRC's efforts over the next several years.

3. The Keystone bulkhead seal has created a blowout upslope. The UAA states this discharge as well as discharges from the Upper Windy Camp anoxic limestone drain is scheduled to be routed through a treatment unit. Table 4 in the UAA indicates these discharges will be treated in 2004.

The sources of acid rock drainage noted above, in addition to the Bear Portal which drains into the Weil tributary to West Squaw Creek, are the last point sources to be addressed in the West Squaw Creek watershed. These sources are scheduled to be addressed this year.

4. Monitoring will be sufficient to assure there is no backsliding from current conditions in the receiving water as well as downstream in Shasta Lake.

Continued monitoring of West Squaw Creek will be required in the NPDES permit issued to MRRC. Regional Board staff will also continue to monitor West Squaw Creek and Shasta Lake to assure there is no backsliding. Regional Board staff will consult with CDFG in developing the monitoring program.

5. DFG recommends that MRRC prepare a contingency plan for reasonable foreseeable failures in the containment of the acid rock drainage (ARD) in the body of the mines.

Regional Board staff will place a requirement in the NPDES permit when it is revised for MRRC to develop such a contingency plan.

6. Monitoring must be sufficient to determine location of future seeps, leakage and blowout.

See Regional Board Staff Response To Comment No. 4 above.

7. The baseline conditions should be carefully documented to insure compliance with the Federal Antidegradation policy and State Water Resource Control Board policies and resolutions which regulate discharge of pollutants and maintain high quality of water in California.

See Regional Board Staff Response To Comment No. 4 above.

8. 5.1 Antidegradation, Page 35, first paragraph states: "It is not feasible to reduce discharges of metals to concentrations sufficient to support WARM, COLD, or SPWN because even if all point source discharges were controlled, naturally occurring nonpoint

source discharges would continue to cause the water to exceed protective concentrations.” Please add, “man-made nonpoint sources” to the above language. We believe, as stated on page 48 of the staff report, “The effects of mining-induced contamination and natural water quality on aquatic life in West Squaw Creek, may be inseparable.” We recommend eliminating speculation on natural vs. mining components and focus on controllable factors. This comment also applies to the summary statement for the first paragraph on page 49.

Statement will be changed to state “human-induced and naturally occurring non-point discharges...”.

9. 6.1.1 Discharger Monitoring. A monitoring station in West Squaw Creek immediately upstream of Shasta Lake has been established to provide data on the long term effectiveness of remedial activities and to assure the current water quality is maintained or improved. DFG recommends that monitoring immediately upstream of Shasta Lake be done at more frequent intervals.

The current NPDES permit contains a required monitoring for West Squaw Creek. MRRC and Regional Board staff have developed additional monitoring to help provide more detailed information. Towards this effort, MRRC has installed continuous monitoring devices which collect data on conductivity, pH, and water levels on an hourly basis. One of the continuous monitoring stations is near the West Squaw Creek Bridge. This information not only includes hourly data, but provides detailed data during storm events which otherwise would be unavailable due to their sometimes swift and episodic nature.

10. 7.2 Proposed Project. We recommend adding a section on the purpose and need for the proposed revision to the beneficial use designation. The UAA has an excellent description in Section 1.1.3 found on pages 3 and 4.

Comment Noted.

11. 7.6.17 Water Quality. As stated earlier, baseline/existing conditions are not clearly defined in the document. This is an important definition as it relates to antidegradation, antibacksliding and downstream impacts to Shasta Lake and the Sacramento River. Point and uses are misspelled in the last sentence of the quoted section. We also recommend you add that the nonpoint sources will also be regulated by NPDES permits, as stated in other areas of the staff report.

Comment noted. The large amount of data available at the mouth of West Squaw Creek will be reduced to define the current conditions. This information will be used to assure

no backsliding occurs in water quality and included in a revised NPDES permit to MRRC.

12. 7.7 Cumulative Impact Analysis for the Proposed Project. We suggest that there be disclosure that the downstream environmental resources of Shasta Lake and the Sacramento River are already being cumulatively impacted by metals discharges from the abandoned mines in the West Shasta Mining District. There should be disclosure that the Sacramento River and parts of Shasta Lake are currently listed as impaired water bodies under the Clean Water Act Section 303(d) list and have or are scheduled for total maximum daily load (TMDL) allocations for metals.

Appropriate inclusions will be made to the Staff Report.

Comments of City of Redding (Mr. Michael Warren, City Manager)

The City of Redding submitted comments dated March 24, 2004 to the Regional Water Quality Control Board, Central Valley Region (Regional Board) on the proposed amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), and associated draft Staff Report and draft Use Attainability Analysis. These responses will address those comments.

City of Redding's comments are presented in italics below with the Regional Board responses immediately following.

Page 1, third paragraph

The City has been assured by you and Mr. Pedri that the Basin Plan amendment will not weaken the requirements of MRRC and Millennium Holding, Inc., to comply with their respective NPDES Permits. Mr. Pedri advised on March 12, 2004 that he would ensure that the draft staff report is modified to include a RWQCB-ordered requirement in the MRRC NPDES permit which will require MRRC to upgrade its best management practices to include the best available technology when such technology becomes available. The City has also been assured that enforcement of MRRC's NPDES permit will prevent additional metal loading to the City of Redding's waste water treatment system.

Regional Board staff has included in the proposed *Resolution Amending The Water Quality Control Plan For The Sacramento River And San Joaquin River Basins, To Modify The Beneficial Uses For Fresh Water Aquatic Habitat (WARM AND COLD) And Remove Spawning (SPWN) For West Squaw Creek, Shasta County*, the following finding:

“WHEREAS, the NPDES permit for MRRC will be revised to include a maximum mass metal loading limit at the mouth of West Squaw Creek to assure the current remedial measures remain effective and current metal reductions are maintained, and to include language to assure that as new Best Management Practices are developed, MRRC will be required to implement these practices to continue to reduce metal loading to West Squaw Creek”

Comments of U.S. Environmental Protection Agency (Ms. Kathleen Martyn Goforth)

The United States Environmental Protection Agency (EPA) submitted comments dated 13 April 2004 and 21 April 2004 to the Regional Water Quality Control Board, Central Valley Region (Regional Board) on the proposed amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), and associated draft Staff Report and draft Use Attainability Analysis. These responses will address, in order, the 13 April 2004 letter, comments contained Enclosure A regarding the Draft Staff Report, comments contained in Enclosure B regarding the draft UAA, and finally comments contained in the e-mail dated 21 April 2004.

EPA's comments are presented in *italics* below with Regional Board responses immediately following.

Regional Board Response to Comments on EPA 13 April 2004 letter.

Page 1, second paragraph.

EPA staff recommends the Regional Board staff consider other options such as TMDL development re a case-by-case exception in the belief that "these alternative actions could provide the desired near-term relief and flexibility, while retaining the regulatory incentive for continued progress toward attainment of water quality standards".

Regional Board staff has evaluated these other alternatives and do not believe they are the best alternative in the circumstances. The discharges of acid rock drainage (ARD) to West Squaw Creek and the associated impacts to aquatic life are not temporary or near term. While great progress has been made in reducing the concentrations of metals and increasing the pH in the watercourse, it is apparent that the watercourse will not support fish or other metal and pH sensitive species in the foreseeable future. This is not a short term condition and Regional Board staff believes the beneficial uses assigned to the watercourse should reflect this. Further, beneficial uses are not designated to a watercourse as an "incentive". Beneficial uses are designated by the Regional Board based on past, current, and probable future beneficial uses of the watercourse. The Dischargers (the mine owners) in the watershed will continue to be subject to an NPDES permit, which will continue to require 99 percent removal of metals from point source discharges (mine portals) and implementation of Best Management Practices (BMPs) for non-point sources. Not only will this assure that no backsliding of water quality will occur, but if new applicable BMPs are developed which can be applied to the sources of ARD, the mine owners will be required to implement them. With the collection and treatment of the last few remaining minor point source discharges, the average copper concentration of the watercourse will still be greater than 50 ppb, an order of magnitude over that which is protective of fish. The remaining diffuse sources of ARD are not

amenable to remedy due to the difficulty in identification and access. The remaining ARD is at or nearing the “baseline” level of heavy metals in the watershed.

Page 1, third paragraph

The current draft UAA and Basin Plan amendments propose to completely omit COLD, WARM, and SPWN (warm and cold) from the uses designated for West Squaw Creek, saying that these uses are not “existing” under the Clean Water Act (CWA). We disagree. The documented presence, within recent years, of macroinvertebrates and periphyton throughout West Squaw Creek, and fish (including rainbow trout) in the upper reaches of the Creek, clearly demonstrate the existence of aquatic life uses in this stream. Under the CWA, existing uses can not be removed.

The Regional Board agrees with this comment. Based on conversations with EPA staff, the Regional Board staff modified the proposed Basin Plan Amendments for West Squaw Creek to include Freshwater Habitat (WARM, COLD) with a footnote modifying the use to state “Cold And Warm Freshwater Habitat does not include fish or other metal and pH sensitive aquatic species in West Squaw Creek from the Early Bird Tributary to Shasta Lake” The Staff Report and UAA will be changed accordingly.

SPWN, as defined in the Basin Plan applies only to Stripped Bass, Sturgeon, Shad, Salmon and Steelhead. These fish do not spawn in the lower reaches of West Squaw Creek. The Basin Plan amendment applies only to the lower reaches of West Squaw Creek.

Page 2, first full paragraph

The current proposal does not include site specific objectives; however, the Staff Report indicates that, if the COLD, WARM, and SPWN uses are removed, the cadmium, copper, and zinc objectives contained in Table III-1 of the Basin Plan would no longer apply to West Squaw Creek. This does not appear to be the case. Since the Basin Plan applies the referenced objectives to West Squaw Creek on a solely geographic basis, rather than by tying them to any particular beneficial uses, those objectives would continue to apply.

The Regional Board agrees with this comment. Based on conversations with EPA staff, the Regional Board staff modified the proposed Basin Plan Amendments for West Squaw Creek to include modifications to limit the geographic application of the Water Quality Objectives contained in Table III-1 of the Basin Plan. Those modifications limit the Water Quality Objectives to the “Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City except for West Squaw Creek from the Early Bird Tributary to Shasta Lake” (underlined portion shows added language). The Staff Report and UAA will be changed accordingly.

Second page, second paragraph

The Regional Board's April 2002 Upper Sacramento River TMDL for Cadmium, Copper, and Zinc allocates average dissolved copper and zinc concentrations of 1.3 µg/l and 3.9 µg/l, respectively, to Shasta Dam releases to enable metals loading targets to be met downstream by Keswick Dam releases. The management strategy for that TMDL is based, in part, on assumptions that existing permits for mines in the Shasta Lake area will be enforced to assure maximum removal or containment of heavy metals, and responsible parties will increase remediation efforts at those mines, as needed, during the next five to ten years. Any actions taken regarding water quality standards for West Squaw Creek should be consistent with that strategy and not jeopardize compliance with the TMDL by the Shasta Dam releases.

The proposed amendments do not affect the TMDL for the Upper Sacramento River nor do they adversely impact metals concentrations in Shasta Lake or the Upper Sacramento River.

The Upper Sacramento River TMDL contains several references to the Shasta Lake Mines that either have been addressed or in the process of being addressed. The proposed UAA and Basin Plan amendment are included in the TMDL (see Table 10-1, *Permit Types and Proposed Future Remediation Activities for Shasta Lake Area Mines*, in Chapter 10, Implementation).

Table 10-1 indicates that current and potential BMPs are to be evaluated, and that a UAA for removal of selected beneficial uses to West Squaw Creek will be developed. It also states that further remedial activities will be evaluated and implemented at the mines in the Little Backbone Creek Watershed, and at those mines draining to Horse Creek and Town Creek. This is currently underway.

The NPDES permit for the mines along West Squaw Creek has been effective in requiring the responsible parties to implement remedial measures to decrease metal discharges. This permit will remain in force. However, the permit conditions that require 99 percent removal of metals from point sources and implementation of BMPs has been largely met. If new applicable BMPs become available, the responsible party will be required to implement them.

The TMDL also states the Regional Board staff will “increase monitoring in Shasta Lake (e.g., at multiple depths and location[s] throughout the lake pool) to determine any additional metal sources and to better define metal transport in the lake. Regional Board staff will develop additional mine remediation and other activities as needed to address metal concentrations in Shasta Dam releases that exceed 1.3 ug/l dissolved copper and 3.9 ug/l dissolved zinc”. Regional Board staff has, and will continue to conduct such

monitoring. Metals data gathered from Shasta Lake since 2002 has helped define the distribution of metals both vertically and laterally in the lake. A staff report titled *Interim Report, Metals Distribution Within Shasta Lake, Shasta County, California*, (May 2003) was issued and copies sent to both EPA and the Bureau of Reclamation. Further data has been gathered and another report will be issued shortly. This data is directly applicable to the evaluation of the copper concentrations passing through Shasta Dam and operation of the Temperature Control Device (TCD) on Shasta Dam as explained below. Further, Regional Board staff is recommending the owners of the mines at West Squaw Creek, after completing implementation of the last few available and applicable BMPs in West Squaw Creek, to move their emphasis to the mines in Little Backbone Creek, which is currently the largest source of metals to Shasta Lake. Successful remedial activities at these mines will significantly reduce the metal concentrations in Shasta Lake and therefore, those exiting Shasta Dam.

While the TMDL does state that 1.3 ppb of copper is the target for discharges from Shasta Dam, it must be noted that this is an **average** concentration provided by a model developed by EPA. Regional Board staff questions the applicability of the data used in the model as it was based on values obtained between 1994 and 1997, before operation of the TCD at Shasta Dam (See Response to Comments Water Management Feasibility Study and Addendum, Volume 2 of 5, *Technical Memorandum, Metal Concentration in Spring Creek Powerhouse and Shasta Dam Releases*, page 2-558 prepared by John Spitzley, CH2M HILL for Rick Sugarek, U.S. EPA). Further, a single average value ignores the seasonal variation in the data that has increased over the past four years. The range of copper concentrations exiting the dam after installation and operation of the TCD appear to have increased. This appears to be due to the inadvertent effect of the TCD drawing water from an interval within the lake that contains higher copper concentrations in the winter months than that prior to installation of the TCD.

MRRC, the owners of the mines in the West Squaw Creek and Little Backbone Creek drainages plan on moving their activities to what are currently the largest sources of ARD to Shasta Lake, those abandoned copper mines in the Little Backbone Creek watershed. If similar reductions in metal loadings can be achieved in Little Backbone Creek, then metals in Shasta Lake will be greatly reduced.

Page 2, third full paragraph

The Upper Sacramento TMDL notes that the Regional Board intends to develop a separate TMDL to address individual sources of dissolved cadmium, copper, and zinc to Shasta Lake. In the absence of that separate TMDL, the assertion, in the proposed Basin Plan amendment, that relaxation of the objectives applicable to West Squaw Creek “will allow for greater overall reduction in metal loading to Lake Shasta and the Sacramento River” by allowing Mining Remedial Recovery Corporation “to focus its available

resources on additional sources of ARD in other watersheds” cannot be adequately evaluated.

The current metal loading to Shasta Lake is as follows: Town Creek 7.6 lb/day, Horse Creek 10.1 lb/day, West Squaw Creek, 18.2 lb/day, Little Backbone Creek 69.6 lb/day, Total 105.5 lb/day. Discharge from Shasta Dam 91.7 lb/day. Data is from monitoring reports submitted by Millennium Holdings Inc. (owners of Bully Hill and Rising Star Mines on Horse Creek and Town Creek, and MRRC (owners of the mines on West Squaw Creek and Little Backbone Creek. Discharge data from Shasta Dam is provided by the Bureau of Reclamation. A table with this information will be included in the Staff Report.

Response to Enclosure A, Comments of Draft Staff Report And Functional Equivalent Document

Page A-0, Item 1

Page 3, 3rd paragraph: “In accordance with the permit, metal loading (copper, cadmium and zinc) from point sources must be reduced by 99 percent . . .”

Please identify the baseline against which this reduction is measured for each metal.

The baseline data was developed by Regional Board staff and is contained in Table 1 of Order No. R5-2002-0153 (NPDES Permit No. CA 0081876) adopted for Mining Remedial Recovery Company on 6 September 2002. An average metal load was calculated using data prior to installation of bulkhead seals in each portal for copper, zinc, and cadmium. A value was calculated for each separate portal.

Page A-0, Item 2

Page 3, last paragraph: “Some abandoned and historic mine sites, such as those in the West Squaw Creek drainage, are unique from other NPDES regulated discharges. Due to the remoteness and steepness of the terrain in the vicinity of the mines, and the nature of the sources areas (both point and non-point), many remedial technologies are not economically or technically feasible. Further, as remedial efforts are implemented to address the major discharges of metals to the watercourses, costs increase exponentially to address the remaining, generally smaller and more complex, sources.”

It is not clear what sets the mines in the West Squaw Creek drainage apart such that remedial technologies that are feasible at other mine sites in the West Shasta area, which are also located in steep, remote terrain and involve both point and nonpoint sources, are infeasible in the West Squaw Creek drainage. It is common in many pollution control situations for the unit costs of controlling the last increments of the pollution to exceed

those of controlling the bulk of the pollution; however, such costs are not considered a basis for beneficial use removal under 40 CFR 131.10(g)(3), which is cited on page 13 as the use removal factor upon which the draft UAA is based.

The statement was simply to communicate the difficulties in applying remedial measures in the area of West Squaw Creek and to indicate that access to infrastructure (power, adequate roads, access etc) is not available. Further, the remaining diffuse sources of ARD are difficult to identify and impossible, using available BMPs, to fully remediate.

The difficulty, if not the impossibility is demonstrated also at Iron Mountain Mine where, despite the expenditure of several hundred million dollars, the streams tributary to Lower Spring Creek will not support fish and other pH and metal sensitive species.

Page A-0, Item 3

Page 5, last paragraph: "The affect [sic] of a Basin Plan amendment removing those uses would be to have the RWQCB delete relevant requirements from the NPDES permits."

This statement seems contradictory to the statement on page 2 of the draft UAA that, "[w]hen this amendment is adopted, discharges from the abandoned mines in the West Squaw Creek watershed will be in compliance with the existing NPDES permit".

The last statement (page 2 of the draft UAA) is in error. It is planned that if the proposed amendments are adopted and approved, the NPDES permit will be revised to omit the receiving water limits and in their place, include maximum loading limits based stream data at the West Squaw Creek Bridge. The UAA will be modified to correct this statement.

Page A-0, Item 4

Page 5, last paragraph: "This change would allow MRRC to focus its available resources on additional sources of ARD in other watersheds which will allow for greater overall reduction in metal loading to Lake Shasta and the Sacramento River."

The draft UAA does not support this statement with any data regarding the relative contributions of West Squaw Creek discharges and those in other watersheds. A TMDL for Lake Shasta and its tributaries would provide the appropriate context for considering such trade-offs.

See Regional Board Response to Comments on EPA 13 April 2004 letter Page 2, third full paragraph above.

Page 6, 3rd paragraph: “Following construction and filling of Shasta Dam, completed in 1945, fish kills were documented from ARD in the vicinity of the West Shasta Copper Mining District. These included fish in the West Squaw Creek arm of the lake immediately adjacent to the mouth of West Squaw Creek.”

The occurrence of fish kills “immediately adjacent to the mouth of West Squaw Creek” suggests that fish may have inhabited or opportunistically used the lower reaches of the Creek even prior to the initiation of remedial activities. Does the available documentation indicate which species of fish were found? In the absence of survey results to the contrary, we caution against assuming that fish have not used the lower reaches of the Creek at any time since November 28, 1975, given the improvements in water quality that have been achieved in that time.

California Department of Fish and Game has investigated the fish kills observed in the West Squaw Creek arm of Shasta Lake and the potential occurrence of fish in West Squaw Creek. No fish have been observed at any time in West Squaw Creek.

The report titled *Investigation of Mine Drainage Related Fish Kills In The Little Squaw Creek Arm of Shasta lake, Shasta County, California, 1974*, was written by scientists from the California Department of Fish and Game. This report describes the fish kills, including species of fish and the origin of the fish. The report notes the toxic concentrations of copper in West Squaw Creek and extending out into Shasta Lake. Thirteen species of fish were observed, including Rainbow Trout, Brown Trout, Smallmouth bass, Crappie, Bluegill, Carp, Kokanee, White Catfish, Green Sunfish, Channel Catfish, Largemouth Bass, Sacramento Blackfish, and hardhead. Tagged trout were planted some distance from West Squaw Creek: Antlers, approximately 12 miles uplake and Ellery Creek campground, 20 miles uplake from West Squaw Creek. While this appeared to help reduce fish mortality, dead tagged trout were still found in the West Squaw Creek arm. This report provides that, at least for the planted trout, the fish were not from the immediate area, but migrated some distance.

The report titled *Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities*, California Department of Fish and Game. 2001, provides the biological bases of the UAA and Staff Report. Scientists from the Department of Fish and Game investigated West Squaw Creek and did not find any fish in the creek. These citations will be added to the Staff Report.

Page 7, 2nd paragraph: “These objectives are also exceeded in portions of West Squaw Creek not directly impacted by past mining activities.”

To which portions of West Squaw Creek does this statement refer? Please provide the supporting data.

Two tables are included at the end of the Water Quality Appendix of the UAA. The tables contain data from the report titled *Preliminary characterization of water quality and sources of metals, West Squaw Creek, Shasta County*, Shepherd Miller, 1996. Data was also evaluated from the required monitoring of West Squaw Creek by MRRC as part of their NPDES permit. Monitoring station R-5 (upstream location in West Squaw Creek) shows the copper level of 5.6 is exceeded at least 18 percent of the time, and zinc level of 16 ug/l is exceeded 36 percent of the time (Values are not hardness adjusted and actual percentages are probably higher because early detection limits were 10 for copper and 20 for zinc). The UAA will be modified to include a citation to the Shepherd Miller Study in the Water Quality Appendix of the UAA. A table with the NPDES upstream monitoring data will also be included in the UAA and cited in the Staff Report.

Page A-1, Item 7

Page 10, 2nd paragraph: “In implementing this goal, USEPA requires that states designate all waters as supporting a fishery and contact recreation.”

This is incorrect. As noted in the sentences preceding this one, EPA’s regulations require states to “take into consideration the use and value of water for various uses, including ‘protection and propagation of fish, shellfish and wildlife’ and ‘recreation in and on the water’”, but allow these Clean Water Act goal uses to be removed, sub-categorized, or omitted from designation if their attainment is demonstrated, through a Use Attainability Analysis, to be infeasible due to one or more of the use attainability factors provided in 40 CFR 131(10)(g).

Comment noted. The Staff Report will be changed accordingly.

Page A-1, Item 8

Page 10, 3rd paragraph: “Existing uses must be fully protected and cannot be removed (40 CFR 131.12(a)(1).”

The prohibition of removing an existing use is found at 40 CFR 131.10(h)(1). The antidegradation regulation at 40 CFR 131.12(a)(1) requires that existing uses and the level of water quality necessary to support such uses be protected.

Comment noted. The Staff Report will be changed accordingly.

Page A-2, Item 9

Page 24, "Recommended Alternative": "Alternative 3 is the recommended alternative since the action would:

- 1. Be consistent with state and federal water quality laws and policies;*
- 2. Is protective of current and post 1975 beneficial uses and improvements in water quality attained since 1975 . . ."*

EPA disagrees. Removal of the COLD, WARM, and SPWN use designations would be inconsistent with federal water quality laws and regulations because it would not protect the existing aquatic life in West Squaw Creek.

Regional Board staff agrees COLD and WARM exist to a certain extent in the affected portion of West Squaw Creek. SPWN as defined in the Basin Plan does not apply to West Squaw Creek. See response to comments on the 13 April letter, Page 1, third paragraph, above.

Page A-2, Item 10

Page 25, 2nd paragraph: "Adoption of Alternative 1 (No Action) would not result in demonstrable benefits to improve water quality and reduce metal loading to West Squaw Creek . . ."

The basis for this statement is not clear, given that the current designated uses have apparently driven substantial improvements in water quality and reductions in metal loading to date.

As discussed in the UAA and Staff Report, the mine owners have implemented remedial activities to both point and non-point sources of ARD. The remaining sources are diffuse, difficult to identify and impossible to collect and treat. The mine owners have implemented applicable BMPs and the resulting water quality will still not support fish and other pH and metal sensitive aquatic species. Leaving unattainable beneficial uses assigned to the watercourse will not change the fact that West Squaw Creek does not, and will not in the foreseeable future, support fish and other pH and metal sensitive aquatic species.

Page A-2, Item 11

Page 26, last paragraph: “The chemical characteristics varied among reaches . . .”

Rather than the ranges reported in this paragraph, the actual values for pH, hardness, temperature, etc. that were measured at specific locations, and when and how frequently those values were recorded, would be more useful information. For example, was the pH of any reach consistently or usually above 6.5? How often was the pH less than 6.5 in each reach? Since the ranges provided in this paragraph were obtained from a biological assessment conducted “[i]n the fall of 1999”, they represent a very limited, and perhaps outdated, snapshot of conditions in the Creek.

Extensive data collected in West Squaw Creek is presented in the UAA, Water Quality Appendix. The Staff Report relies on the UAA to provide the data for support for the proposed amendments. Data is constantly being collected and therefore cannot always be presented in a given report.

Page A-2, Item 12

Page 27, 2nd paragraph: “Elevated levels were also found in the background reach of upper Squaw Creek where no mining has taken place. Cadmium, copper, and zinc concentrations were measured up to 38.0 µg/l, 2390 µg/l, and 6,020 µg/l, respectively in the affected area of West Squaw Creek.”

How elevated were the levels in the background reach? In which segment(s) of the affected area were the maximum values reported here recorded? Please provide the data for all of the sampled reaches.

See Regional Board Response to Comments for Page A-1, Item 6, above.

Page A-2, Item 13

Page 27, 3rd paragraph: “Three communities of organisms, periphyton, benthic macro-invertebrates, and fish were collected to assess the biological conditions of the stream.”

The presence of these communities demonstrates that aquatic life uses are existing, as that term is defined in 40 CFR 131.3, in West Squaw Creek.

Regional Board staff agrees. See response to comments on the 13 April letter, Page 1, third paragraph, above.

Page A-3, Item 14

Page 28, 3rd paragraph: “There seems to be a slight improvement in some of the biological measures at the downstream sites on West Squaw Creek.”

To which downstream sites does this refer?

The improvements are discussed in Table 3-4 *Physical Habitat Assessment Reach Specific Results*, and shown graphically in Figure 3-4 *Biological Assessment Results West Squaw Creek Watershed* of the UAA. These show where the acidophilic diatoms decrease and *achnanthes minutissima* increase at stations WSC-6 and WSC-7. It is important to note that WSC-6 and WSC-7 are located downstream of the confluence of the North Fork West Squaw Creek. The data is from the report titled *Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities*. California Department of Fish and Game, 2001.

Page 38 of the 2001 report states “There seems to be a slight recovery of some of the biological measures at the downstream sites on WSC. Acidophilic diatoms no longer dominate the periphyton community and there is a slight increase in macroinvertebrate taxa associated with an increase in the prevalence of grazing and filtering macroinvertebrates.” The Staff Report will be modified to reference these items in the UAA.

Page A-3, Item 15

Page 29, 2nd paragraph: “Impacted portions of West Squaw Creek currently support an acid tolerant benthic invertebrate community. Over time it is the goal of the RWQCB and MRRC to continue to make improvements to stream conditions within the watershed. However, it is unlikely that the stream will ever support beneficial uses of WARM, COLD, and SPWN due to the concentrations of metals from non-point, uncontrollable sources.

The WARM and COLD use designations, as defined in the Basin Plan, include “uses of water that support [warm/cold] water ecosystems including . . . invertebrates”; therefore, one or the other, if not both, of these uses are existing uses.

Regional Board staff agrees. See response to comments on the 13 April letter, Page 1, first full paragraph, above.

Page A-3, Item 16

Page 30, last paragraph: “If the beneficial uses are modified in the Basin Plan, the water

quality objectives listed above would no longer apply to West Squaw Creek.”

The referenced objectives would continue to apply because they are assigned geographically to the “Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City”; the Basin Plan does not limit their applicability to any particular uses.

Regional Board Response to Comments on EPA 13 April 2004 letter, Page 2, first full paragraph above.

Page A-3, Item 17

Page 31, 3rd paragraph: “Monitoring data from the mine discharges and the receiving waters indicate that even if all portal flows were eliminated and all waste rock dumps adequately controlled, the receiving water concentration of metals from non-point sources in West Squaw Creek would still continue to exceed water quality objectives to protect fish and would prevent the establishment of a warm-water or cold-water fishery or spawning habitat in West Squaw Creek.”

Please provide the data and any associated analyses that support this statement, as well as data that indicate the effectiveness of the controls implemented to date, the expected effectiveness of controls that are currently being implemented or are planned, and the expected water quality in segments of West Squaw Creek. The options for reducing discharges from controllable nonpoint sources should also be discussed.

The tables containing pre and post remedy data are contained in the Water Quality Appendix of the UAA and summarized in Tables 2, 3, and 4 of the Appendix and in Tables 2-3, 2-4, and 2-5 of the UAA. These tables contain information on point and non-point sources of ARD. There are few significant controllable non-point sources of ARD remaining. As the tables indicate, even with the anticipated controls implemented, copper loading will still be 16 pounds per day. Assuming that the average annual flow rate at the West Squaw Creek Bridge is 25,000 gpm (see Water Quality Appendix of the UAA), this would yield an average dissolved copper concentration of 50 ug/l. The Staff Report will be modified to reference these tables.

Page A-3, Item 18

Page 32, 1st paragraph: “The current metal concentration and loading documented in the watercourse is measured at the West Squaw Creek Bridge, immediately upstream of Shasta Lake.”

The previous draft of the UAA provided data for several other monitoring locations, as well. Why is current monitoring limited to the West Squaw Creek Bridge?

The West Squaw Creek Bridge is immediately upstream of Shasta Lake and provides the best monitoring point for measuring effectiveness of all remedial activities and overall condition of the creek. This monitoring point has the most historical data and is the easiest to access in all weather conditions. Other points in the watercourse will be periodically monitored; however, due to accessibility and safety concerns, monitoring of these points is limited.

Page A-3, Item 19

Page 32, 2nd paragraph: “The monthly data presented in the UAA are variable as a result of variations in stream flows and metal discharges from precipitation events, season changes, and climate changes. A specific instantaneous number is therefore unrealistic and meaningless for regulatory compliance and data must be averaged over an extended period of time to reduce the natural variability.”

Water quality objectives can be established that take natural variability into account. Have Regional Board staff considered establishing seasonal objectives for West Squaw Creek?

Regional Board staff considered and rejected seasonal objectives in the Basin Plan. Due to the inherent variability of the data, it would be an onerous effort that would not be readily defensible with little benefit. Staff will develop seasonal mass loading limits for metals to include in the NPDES permit for the West Squaw Creek mines to assure no backsliding of water quality occurs.

Page A-4, Item 20

Page 34, last paragraph: “The beneficial uses of WARM, COLD, and SPWN are not existing uses as that term is defined in 40 CFR 131.3.”

As noted above, EPA does not agree, due to the presence of aquatic macroinvertebrates, periphyton, and, in some reaches of the creek, fish.

Regional Board staff agrees. See response to comments on the 13 April letter, Page 1, third paragraph, above.

Page A-4, Item 21

Page 35, 1st paragraph: “It is not feasible to reduce discharges of metals to

concentrations sufficient to support WARM, COLD, or SPWN because even if all point source discharges were controlled, naturally occurring non-point source discharges would continue to cause the water to exceed protective concentrations.”

No data are provided in the Staff Report to support this statement. Data provided on page 38 of the draft UAA appear to indicate that background concentrations were below detection limits in the habitat assessment conducted by CA Department of Fish and Game in 1999. If, however, other available data demonstrate that naturally-occurring discharges alone would cause the currently applicable objectives to be exceeded, the Regional Board may wish to consider establishing site-specific water quality objectives for West Squaw Creek based on natural background concentrations.

Regional Board Staff agrees this statement cannot be supported. The task of attempting to quantify what would be natural background had mining not occurred is impossible due to the pervasive surface and subsurface disturbances of mining. How water may have moved through the fractures and fissures, contacted the ore body etc. cannot be defined.

The statement “*..naturally occurring non-point source discharges...*” will be modified in the Staff Report to state “human-induced and naturally occurring non-point discharges...”. See Regional Board response to Item 17 above.

Page A-4, Item 22

Page 35, 1st paragraph: “Therefore, removing the beneficial uses of WARM, COLD, and SPWN is consistent with the federal antidegradation policy. The proposed Basin Plan amendments will not affect existing water quality. Water quality in West Squaw Creek will continue to improve incrementally as technology becomes available and best management practices are applied to point and non-point sources as required under the NPDES permit issued to MRRC.”

Removal of the WARM and COLD – and for at least some segments of West Squaw Creek, SPWN – use designations would not be consistent with the federal antidegradation policy because these uses are existing uses, which, under that policy, must be protected. It is not clear, from the information provided, on what basis the permit would require application of additional point and non-point source controls if the use designations that appear to be driving the need for such controls were removed.

See response to comments on the 13 April letter, Page 1, third paragraph, above. Even with the beneficial uses modified, the Clean Water Act still requires implementation of BMPs to reduce or prevent the discharge of pollutants to surface waters to the extent feasible.

Page A-3, Item 23

Page 69, Table 7-1: “Accessible portals and those with year-round flows are sealed.”

Have the feasibility and likely benefits of sealing portals with seasonal or otherwise intermittent flows been evaluated?

There is only one portal remaining with seasonal discharges. That portal is scheduled for sealing this summer. The incremental benefits to decreasing copper concentrations in West Squaw Creek are included in Tables 2-3, 2-4, and 2-5 of the UAA.

Page A-5, Item 24

Page 69, Table 7-1: “MRRC has been funding research in this area for the past three years. In-field project studies have been effective. The treatment is being tested at the Stowell Mine with injection occurring in Summer, 2002.”

What were the results of the testing at the Stowell Mine?

Data on the effects of injecting organic material into the mine workings is still being gathered and evaluated.

Page A-5, Item 24

Page 69, Table 7-1: “Pipe ARD to Iron Mountain Treatment . . . Low.”

The factors limiting the feasibility of this option should be presented.

The Staff Report will be modified to provide a description of the issues, including interfering with a remedy at a CERCLA site, assignment of liability for the additional ARD, willingness of current responsible party of the treatment plant (AIG) to accept the added responsibility, and cost/benefit.

Response to Enclosure B, EPA’s Comments Regarding Specific Details of the Use Attainability Analysis.

Page B-0, Item 1

Page 2, 3rd paragraph: “When this amendment is adopted, discharges from the abandoned mines in the West Squaw Creek watershed will be in compliance with the existing NPDES permit.”

This suggests that no changes would be made to the existing NPDES permit to reflect the use removals; however, this statement seems contradictory to the statement on page 5 of the draft Staff Report that, “[t]he affect [sic] of a Basin Plan amendment removing those uses would be to have the RWQCB delete relevant requirements from the NPDES permits.”

See Regional Board Staff Response to Comments on Page A-0, Item 3 above.

Page B-0, Item 2

Page 8, 3rd paragraph: “The numeric standards for the Sacramento River and its tributaries above State Highway 32 Bridge, that apply to abandoned copper mines including those in the West Squaw Creek watershed . . . “

Water quality standards apply to water bodies, not to mines or other pollutant sources.

The UAA will be modified to reflect this comment.

Page B-0, Item 3

Page 13, 2nd and 3rd paragraphs: “California Department of Water Resources (DWR) produced a report on the water quality of West Squaw Creek . . . The study also addressed the seasonality of fish kills and suggested remedial measures . . . Fish kills were documented by Hansen and Weidlein (1974). Their investigation evaluated West Squaw Creek from September 1968 to July 1969 . . . As fish kills occurred, the species were identified . . . Two major conclusions reached by Hansen and Weidlein were . . . fish kills are related to the time and location of fish planting . . .”

Did the reported fish kills occur in the Creek itself or in the lake at the mouth of the Creek? Which species were involved? Did/does fish planting occur in West Squaw Creek? If so, did this practice continue or occur at any time after November 28, 1975?

The fish kills occurred in the West Squaw Creek arm of Shasta Lake. The fish were planted some distance away from West Squaw Creek, in some instances over 20 miles. See Regional Board Staff Response to Comments on Page A-1, Item 5 above.

Page B-0, Item 4

Page 13, 3rd paragraph: “The difference in surface-to-bottom concentrations of copper suggested stratification regardless of the time of year . . .”

At what stratum were the highest concentrations generally found?

The report titled *Investigation of Mine Drainage Related Fish Kills In The Little Squaw Creek Arm of Shasta lake, Shasta County, California, 1974*, was written by scientists from the California Department of Fish and Game. They conclude from their data that bottom concentrations of copper were “generally higher”. A more recent and thorough investigation is presented in the report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003. This investigation shows that metal distribution within Shasta Lake, including the West Squaw Creek arm, is controlled by thermal stratification within the lake and there is considerable seasonal variation which may be attributed to both variations of the sources of the metals and mixing within Shasta Lake.

Page B-0, Item 5

Page 13, 3rd paragraph: “Two major conclusions reached by Hansen and Weidlein were: . . . (2) toxic copper concentrations extend a minimum of 1,645 meters into Shasta Lake from the mouth of West Squaw Creek.”

The referenced data were collected in 1968 and 1969. What are the current conditions in the West Squaw arm of Shasta Lake? Under 40 CFR 131.10(b), when designating uses and criteria for a water body, states are required to “. . . ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.” The UAA should demonstrate that attainment and maintenance of the water quality standards for Shasta Lake would not be jeopardized by the proposed amendments.

As discussed in Regional Board Response To Comments, page B-0, Item 4 above, Regional Board staff has conducted extensive studies of metals distribution in Shasta Lake, including the West Squaw Creek Arm. At certain times of the year, metals within certain vertical limits have exceed the Water Quality Objectives of 5.6 ppb for copper. These exceedences are limited in their vertical extent. However, no fish kills have been noted at any distance from the mouth of the affected tributaries, including West Squaw Creek. Further, the NPDES permit requires continued implementation and maintenance of BMPs, including new BMPs if, in the future new applicable technology comes available. The proposed changes in beneficial uses do not affect these requirements.

Page B-1, Item 6

Page 22, 4th paragraph: “Average annual dissolved copper, cadmium, and zinc concentrations for the sample location at the West Squaw Creek Bridge are summarized

in Table 2-6 . . . ”

It would be helpful to see the raw data for recent years since annual averages do not reflect seasonal variability nor allow assessment of the frequency with, and magnitude by, which the objectives are exceeded.

The complete data set is contained in the Water Quality Appendix of the UAA. A footnote will be added to the table directing the reader to the Water Quality Appendix.

Page B-1, Item 7

Pages 23-25, Tables 2-3, 2-4, and 2-5: Are the values in these tables averages or maximum values?

The numbers in the tables are averages. Footnote 1 in the tables directs the reader to the Water Quality Appendix of the UAA for additional details such as number of samples, etc.

Page B-1, Item 8

Pages 23-25, Tables 2-3, 2-4, and 2-5: These tables indicate that substantial percent reductions in metals loading are anticipated by 2004. What metals concentrations are likely to be attained through these loading reductions?

See Regional Board Response to Comments Page A-3, Item 17 above.

Page B-1, Item 9

Page 26, Table 2-6: Please provide the units for this table.

The table will be corrected to include the proper units (ug/l).

Page B-1, Item 10

Page 26, Table 2-6: “² 2003 copper average does not include three samples analyzed by MRRC at its in-house laboratory. If these results are included, the average dissolved copper concentration for 2003 is 11 µg/l.”

Why were the values for those three samples not included?

MRRC's in-house laboratory is not certified by the State of California and therefore the analyses are not conducted pursuant to an approved QA/QC program. This data is not used for regulatory compliance. When MRRC determines a specific analyses is below detection limits, they report the data as "0". Typically, non-detectable results are incorporated into a data set as ½ the detection limit. In this case, such a methodology is meaningless. By omitting the "0" data, the resulting averages are higher and therefore more conservative.

Page B-1, Item 11

Page 30, section 3.2 Stream Segment Identification: The descriptions of the stream segments differ from those in the previous draft of the UAA in terms of the number of segments and the length of each segment/tributary (for example, segments EB and PA are each described in the current draft as being approximately twice as long as they were in the previous draft). Do these changes correct inaccuracies in the previous draft or indicate changes to the scope of the geographic area covered by the UAA? The previous draft identified the East Fork of Weil tributary as an impacted segment. Why is that fork not discussed in the current draft? Also, the previous draft broke segment WSC into three segments, and indicated that the upper segment (between Early Bird confluence and Windy Creek confluence) was close to meeting objectives, while the lower segments substantially exceeded the objectives. What is the rationale for omitting this distinction?

In response to EPA's review of the Administrative Draft of the UAA it was determined that the UAA would be best presented and the conclusions better supported with fewer stream segments.

Page B-2, Item 12

Page 32, 4th paragraph: "In order to evaluate 'natural' conditions in the West Squaw Creek watershed, Shepard Miller (1996a) conducted an evaluation using Runnels methods. This evaluation illustrates that the numeric objectives in the Basin Plan for the protection of a warm and cold-water fisheries are unrealistic in areas with significant metal sulfide deposits."

Based upon work performed by the U.S. Geological Survey for EPA at Iron Mountain mine, where Shepard Miller performed a similar study, this approach overestimated the pre-mining metal concentrations by a factor of 700. Three studies performed for EPA at Iron Mountain Mine portray a consistent picture that indicates that aquatic life existed in the streams adjacent to the massive mineralized body at Iron Mountain prior to mining.

Comment noted. Please provide Regional Board Staff with the references EPA cites and, if applicable, this information will be incorporated in the UAA.

Pages 37-40, Sections 3.4.1 and 3.4.2 regarding Physical Habitat Assessment: Table 3-3 shows significant differences between the concentrations found in the background reaches and reach WSC-2 versus those found in reaches WSC-3 through WSC-7. This distinction should be reflected more clearly in the text. For example, the third paragraph on page 40 begins, “[c]opper concentrations in West Squaw Creek were >2000 µg/l”, although such levels were only found in three of the seven sampled reaches of the Creek. Also, the 4th paragraph on page 40 states, “[z]inc concentrations at the downstream West Squaw Creek sites were in excess of 4,500 µg/l”. This is misleading, since only WSC-3, WSC-4, and WSC-5 were in that range. The two sites furthest downstream – WSC-6 and WSC-7 – had zinc concentrations of 1,780 µg/l and 613 µg/l, respectively. It appears that the cadmium, copper, and zinc concentrations at the background sites, as well as at WSC-2 and WSC-7 (for copper only) were all below detection limits. We recommend that those sites be re-sampled and analyzed using available methods with lower detection limits to provide a more precise assessment of ambient concentrations relative to the applicable objectives.

Comment noted. Sampling of the watercourse is an on-going process and additional samples will be taken and the results evaluated.

Page 47, Table 3-5: The discussion of WSC-3 notes that “[n]o fish were identified at this site”; however, the discussions of WSC-4 and WSC-5 say “[n]o fish were observed at this site”. Were fish observed, but not identified as to species, at WSC-3, or was no distinction intended between “identified” and “observed”?

Table 7, page 17 of the report titled *California Department of Fish and Game. 2001. Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities* shows no fish were found at any of the lower sampling sites.

Comments of U.S. Environmental Protection Agency (Ms. Kathleen Martyn Goforth), submitted April 21, 2004.

The use designation part of the revised proposal is an improvement over that presented in the draft Staff Report to the extent that it recognizes the existing aquatic life use. Some refinement or further documentation of the extent of the acid/metals-limited portion of the Creek may be needed, given the age and one-time nature of the bioassessment data, and the fact that no fish sampling was conducted in the most downstream segment. Also, it is not clear whether potential further improvements in water quality, resulting from recent and planned remedial actions, have been factored in to the use designation. Another critical issue is the need to demonstrate that the designated/existing uses will be protected by appropriate criteria/objectives, as required by 40 CFR 131.11. If the site-specific objectives in Table III-1 of the Basin Plan are removed from applicability to West Squaw Creek, then it appears that the CTR criteria become effective for the Creek. Will those criteria be adequate to protect the existing/designated uses in the Creek and downstream, and to ensure no degradation? The Staff Report should be revised to address these questions.

Sampling of the West Squaw Creek was conducted by scientists from the California Department of Fish and Game and described in the report titled *Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities*, California Department of Fish and Game. 2001 These scientists are well versed in fish sampling and habitat. If they either did not sample for fish or did not find fish, it is because they, based on their experience and/or the site characteristics, determined that fish were not present. This was further supported by staff from the Department of Fish and Game during testimony at the Regional Board hearing held on 22 April 2004.

The remedial activities planned for this summer will reduce metal loading to West Squaw Creek, however the creek will still contain concentrations of copper well above the toxicity threshold of fish. See Regional Board Response To Comments Page A-3, Item 17 above.

If the Basin Plan is amended as proposed, the following water quality standards for the protection of the existing uses of West Squaw Creek will continue to apply:

Federal Policy

Federal Antidegradation policy (40 CFR 131.12), which states, in part:

“The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.”

California Toxics Rule: Those CTR criteria that apply to the remaining designated beneficial uses. Because the proposed Basin Plan Amendments do not include the protection of “fish and other pH and metal sensitive species”, CTR objectives for protection of sensitive aquatic organisms do not apply.

State and Regional Water Board Policies: These policies and others would require the Regional Board to require, at a minimum, that dischargers into West Squaw Creek continue to maintain existing management practices.

State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California

State Water Board Resolution No. 88-63, Sources of Drinking Water Policy

State Water Board Resolution No. 90-67, Pollutant Policy Document

Non-point Source Management Plan

Basin Plan Controllable Factors Policy

Basin Plan Antidegradation Implementation Policy

Comments of U.S. Bureau of Reclamation (Mr. Frank Michny and Ms. Michelle Prowse)

In a letter dated 31 March 2004, the Bureau of Reclamation (BOR) provided detailed comments on the Draft Staff Report and Draft UAA. Our response to those comments are shown in italics with the Regional Board's response immediately below in plain text.

General Comments

1.b. Reclamation is not responsible for the metal load reductions. Reclamation has always taken a proactive stance in order to protect water quality for the environment, water users, etc. Reclamation is not a source of mining pollution.

Comment noted.

1.c. West Squaw Creek (WSC) effluent will increase the copper, cadmium and zinc concentrations in Shasta Lake reducing assimilation capacity for downstream dilution from Spring Creek and Iron Mountain Mine (IMM). The proposed amendment must address the projected complex Central Valley Project (CVP) operations.

Discharge of acid rock drainage (ARD) from West Squaw Creek will not increase as a result of the proposed Basin Plan Amendments. The NPDES permit currently regulating the discharges of ARD in the West Squaw Creek watershed require implementation of Best Management Practices to reduce discharges from point and non-point sources. This requirement will not change. MRRC the owners of the mines in the watershed, will always be required to implement BMPs, maintain remedial facilities in the watercourse, and implement new BMPs as they become available. Further, the proposed Regional Board Resolution for adoption of the proposed amendments includes a statement verifying that the NPDES permit for MRRC will be revised to include a maximum mass metal loading limit at the mouth of West Squaw Creek to assure the current remedial measures remain effective and current metal reductions are maintained, and to include language to assure that as new Best Management Practices are developed, MRRC will be required to implement these practices to continue to reduce metal loading to West Squaw Creek. The proposed amendment will have no impact on CVP operations as water quality will not be degraded beyond that which is currently present and water quality will in fact improve due to additional efforts to control the larger sources of ARD in other watersheds.

2. *Temperature Control Device (TCD) operation:*

- a. *The purpose of the Shasta TCD is to conserve and control coldwater resources in Shasta Dam in order to comply with SWRCB WR90-5 intent. (i.e. beneficial use coldwater fishery)*
- b. *The TCD is not operated to control nor manage metal concentrations. It was not authorized for this purpose.*
- c. *To modify TCD operations to draw from deep in the lake (pre-TCD operations at penstock elevation 815) would significantly degrade the coldwater conservation objective.*
- d. *Our current winter time TCD operation is to draw water through the TCD from the highest TCD gate with 30-35 ft of lake submergence. (This conserves the coldwater deep in the lake)*
- e. *If this submergence level is the area of increased metal concentrations, then it affects our dilution capacity at Spring Creek Debris Dam (SCDD) and IMM issues. (Increasing the probability of SCDD spills) and/or prolonged exposure near the Basin Plan objectives or increased need for specific dilution flows from Shasta Lake, which has the potential to become a vicious cycle for metals.*
- f. *If the TCD were operated to draw deep in the lake during the wintertime months, the spring summer coldwater pool would be decreased in volume, becoming a SWRCB 90-5 and ESA winter-run, spring run Chinook salmon issue.*
- g. *The basic point is the TCD does not create nor manage metal issues. The TCD manages thermal characteristics of, and especially releases from Shasta Lake. To infer the TCD is the problem or the solution is a misrepresentation of the metal load and purpose of the TCD operations.*
- h. *It should be noted that although the penstock inlet is at the mid-level of the dam, actual withdrawals from the reservoir could be from various elevations via the temperature control device. The elevation is determined by temperature operations for the Chinook salmon in the Sacramento River; typically higher elevations in the spring, moving lower through the summer into the fall.*

Comments noted. Regional Board staff is not suggesting the BOR modify the operation of the TCD. Staff only points out the fact, based on extensive sampling near Shasta Dam and near the sources of ARD, that operation of the TCD has inadvertently resulted in an increase in metal concentrations exiting the dam in the winter months. This is a result of water being selectively withdrawn from the upper portion of the water column in the

winter months, the same interval where the elevated concentrations of metals are located in the winter period. Based on the data contained in the Regional Board Staff Report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003, and provided to BOR staff shortly thereafter, do suggest the BOR evaluate the advantages of reconfiguring the TCD during short periods of time when dilution water is needed for discharges from Spring Creek Debris Dam impacted by Iron Mountain Mine. It may be possible the TCD could be temporarily reconfigured to draw water from the mid level, avoiding the interval containing elevated metals, while still preserving the cold water pool for later in the year.

3. *Dilution of SPDD acid mine drainage (AMD) with Shasta Lake water*

- a. *"To prevent future exceedances of numeric targets below Keswick Dam, any load reduction allocation has to address the complicated relationship between the timing of discharges from the different metal sources (e.g., discharges resulting from intense storm runoff) and Reclamation's control of Shasta Dam, SCDD, and SCPP releases." Basin Plan objectives –RWQCB*
- b. *USEPA's IMM remedy assumed that the Shasta Dam releases would provide a base load of 2 ppb copper or less and the water would be suitable for dilution with Spring Creek discharges and still meet the Basin Plan objectives. If the proposed amendment would allow releases from WSC that result in higher metal loads entering Shasta Lake, the IMM remedy would be seriously impaired.*

The proposed Basin Plan Amendments will not result in an increase of metals to Shasta Lake or the Sacramento River. See response to 1.c. above.

5. *Overall operations of Reclamation's Central Valley Project*

- a. *The proposed action will affect the way Reclamation operates. Any change in operation will have an impact on Reclamation's ability to meet authorized project purposes and would need further evaluation. Revised operations could have impacts on endangered species, which would have to be addressed.*

The proposed Basin Plan Amendments will have no adverse impacts on water quality or quantity and will therefore not impact any operations at Reclamations Central Valley Project operation. See response to 1.c. above.

Environmental Review of Acid Mine Drainage in West Squaw Creek

Table 2-6 of the UAA summarizes the decrease of AMD, as recorded at West Squaw Creek Bridge from 1968 to 2003. Remedial activities to point sources are described on pages 17- 20. Most of the remedial work was done by 1990, with a final push in 1996. The pH of WSC improved with each point-source remedial activity. The average dissolved copper concentration at the bridge decreased from 556 ppb in 1988 to 278 ppb in 1995 and 1996. The most recent documented fish kill below Shasta Dam occurred in December of 1996.

Regional Board staff are unaware of any fish kills below Shasta Dam in 1996. Table 2-6 also contains data which shows copper concentrations have been reduced to 114 ppb, 86 ppb, and 17 ppb, in 2001, 2002, and 2003, respectively.

The Sacramento River below Shasta Dam carries a significant load of copper. Reclamation measures water quality quarterly below the dam. A pulse of copper is measured in February and May. From 1999 to 2003, the Feb-May concentration averaged 2.8 ug/L and Aug-Nov 1.2 ug/L. This load of copper seems more significant than the reported (page 2 of UAA) 150 lbs/day of metal from WSC.

The comment fails to recognize other sources of metal loading to Shasta Lake include mines near Little Backbone Creek, Town Creek, and Horse Creek. The largest contributor is Little Backbone Creek. Further, the BOR samples copper and zinc below Shasta Dam once a week in the winter and provides that information to other interested agencies. Based on data from the BOR collected below the dam, the load of dissolved copper exiting Shasta Dam averages approximately 100 lbs/day.

The impact from WSC to aquatic life in Shasta Lake must be significant. The mixing zone provided by Shasta Lake is very large. The (California Toxics Rule) CTR criterion for copper is 4. 1 ug/L. With an average of 2.8 ug/L below the dam, much of the lake could be impacted.

Data collected by Regional Board staff shows copper concentrations above the Basin Plan Objectives of 5.6 in Shasta Lake are limited in lateral and vertical extent. See Regional Board Staff Report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003.

The UAA does not stress that pH at the bridge exceeds drinking water, aquatic life, and agricultural water quality standards. These beneficial uses should be addressed. Precipitation of metals into Shasta Lake impacts aquatic life.

The pH at the West Squaw Creek bridge averaged 6.5, 6.7, 6.1, 6.5, and 6.3 for each year from 1999 to 2003.

The U.S. EPA National Ambient Water Quality Criteria for Human Health and Welfare drinking water standard is from 5 to 9 pH units. This was not exceeded.

The U.S. EPA National Ambient Water Quality Criteria for pH for Freshwater Aquatic Life Protection is 6.5 to 9. This was exceeded, on average, twice and is the subject of the proposed amendments.

The Agricultural Water Quality Goals issued by the Food and Agricultural Organization of the United Nations is between 6.5 and 8.4 pH units. These goals were exceeded twice in the past five years. However, West Squaw Creek is not currently used for agricultural irrigation and even if it was, the current pH levels would not significantly impact its use.

While one would intuitively expect the precipitation of metals into sediments in Shasta Lake to be detrimental to benthic aquatic life, there is no data to suggest this is a problem in Shasta Lake. However, this is not the issue or is it related to the modification of beneficial uses in West Squaw Creek.

The pH at WSC Bridge should be in compliance with water quality standards. Table 2-6 shows that water quality at this site is being measured. only a few times each year.

Staff agrees pH should be in compliance with water quality standards for the remaining beneficial uses. Continued implementation of BMPs will attempt to attain this goal. Table 2-6 shows 7 pH measurements in 2003 at the West Squaw Creek Bridge. Currently MRRC has installed a continuous monitoring device that records pH hourly near the bridge.

See Attachment 1 - Baseline Water Quality Monitoring Program (Table)

The referenced table contains 24 data sets from 2/18/1998 to 11/17/2003 on the Sacramento River Below Shasta Dam. Staff has access to more extensive data provided by the BOR containing 431 data sets ranging from 1/30/97 to 11/10/03.

Reclamation has further questions regarding the data collection and data analyses documented throughout the UAA and the Staff Report. The questions raised could be answered by viewing further documentation. The following documents should be addressed where data results are discussed. These documents should be available for review in order to better analyze the data presented by MRRC:

- *Sampling Plans*
- *Quality Assurance Project Plan (QAPP)*

- *Laboratory QA manual / Laboratory run logs*
- *Analytical methods used by lab(s) for analysis*
- *Last 3 years of the laboratory's performance sample results for certification*

It is unclear just what the questions are with the data. The samples were collected in accordance with a Sampling and Analyses Plan submitted by the discharger. Further, a laboratory certified for hazardous waste analyses by the State of California was used for the analyses.

No Best Management Plan was cited in any of the documentation. There should be a Best Management Plan. If one does not exist, it should be addressed prior to initiating a Basin Plan amendment. If a Best Management Plan for WSC does exist Reclamation requests a copy of it for review.

Best Management Practices include those listed in Figure 1-4 of the Staff Report and are in our Basin Plan. Not all of these practices are practical or applicable in West Squaw Creek.

Many mine sites are remote and are located in areas of steep terrain. The technology does exist to remedy most, if not all, of the AMD in the WSC.

Staff disagrees with this statement. Not all sources of AMD are amenable to remedy. Even at Iron Mountain Mine where hundreds of millions of dollars have been spent, fish are not expected to live in lower Spring Creek.

In one sentence the UAA declares that "many remedial technologies are not ... technically feasible due to the remoteness and steepness of the terrain..." The following sentence goes on to say, "Nevertheless, since remedial activities were initiated in 1978..." These sentences contradict each other claiming that current remedies are unavailable, yet remedies began in 1978. Technology advances quickly and despite the fact that the technology may be expensive it does exist and is feasible. Furthermore, implementing new technology would improve the environment not "cause more environmental damage". Not implementing new technologies would cause more environmental damage to Shasta Lake and all the downstream waters as well. Not implementing new technologies would cause "widespread and economic and social impact" to the water users due to higher costs for water deliveries to the water users.

Staff disagrees the two sentences contradict each other. Some technologies and remedies are available, can be implemented at the site, and have been. Other technologies, due to accessibility or infrastructure demand are not practical. As noted by one of the peer reviewers on the UAA, Dr. Fiona M. Doyle, Professor of Mineral Engineering,

University of California at Berkeley: "I believe that the UAA provides an accurate and fair account of the effort that has been expended on improving water quality in West Squaw Creek. The West Squaw Creek watershed presents unusual challenges to any efforts to improve water quality. The watershed is extremely remote, with no available utilities. Road access is limited, and the rugged terrain and harsh climate present additional difficulties. The UAA discusses the monetary expenditures that have been made by MRRC, and the high cost of further work. In addition, however, I would like to add an independent concern of my own, not discussed significantly in the UAA, regarding overall environmental costs and benefits of future remediation work. In cases such as this, I wonder whether, if one were to analyze the overall environment impact of possible future remediation work, in terms of energy requirements, quarrying of limestone and other rock, improving roads to transport raw materials to the mine sites, disposing of reactive materials removed from the mine site, release of particulates into sensitive streams crossed while accessing this remote watershed, etc. one might conclude that future work would be detrimental to the environment, overall."

Point source reductions have been significant with the National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act (CWA) and eliminating this permit requirement would be detrimental even though violations of the objectives occur. Without the NPDES permit requirements there would be no regulatory objectives for the WSC and heavy metal discharges could increase from this area without any incentive to correct them despite the claim that "The mine owners will continue to be responsible for monitoring, maintaining the existing remedial facilities and implementing nonpoint source Best Management Practices (BMPs),..." Without the current NPDES permit requirements these practices will be voluntary, not mandatory. There can be no assurance the practices will be maintained let alone improved.

The NPDES requirements for MRRC will remain along with mandatory requirements to implement BMPs. See response to 1.c. above.

1. 1.3 "...the RWQCB identified the need to further develop solutions to water quality regulations..."

Removing the beneficial use for the WSC area is not a solution to water quality. It is a hindrance. The only issue the removal will solve is that of the violations. A solution would be one that helps the WSC area meet the required water quality criteria, not disregard it.

Data provided in the UAA demonstrates the water quality objectives for support of a fishery in West Squaw Creek is unattainable with current technology. The proposed Basin Plan amendment simply recognizes the reality that this use has not existed and is unlikely to exist in the foreseeable future. The NPDES requirements for MRRC will

remain along with mandatory requirements to implement BMPs. See response to 1.c. above.

Pursuing this modification is not appropriate as it will open the door for all other mines covered under the Basin Plan to use this same method to become exempt from water quality objectives. Removing the beneficial use from the WSC will impact Shasta Lake and downstream waters significantly. If other mines get this same modification the results would be catastrophic given the number of mines covered in the Basin Plan.

The proposed Basin Plan amendment will not have any significant adverse impact on water quality in Shasta Lake. All mines discharging AMD to tributaries to Shasta Lake will continue to be covered under NPDES permits requiring implementation of BMPs. See response to 1.c. above.

The UAA has not demonstrated that the WSC does not have a potential beneficial use for freshwater habitat or fish spawning.

The data presented in the UAA demonstrates that support of fish and other ph and metal sensitive species and spawning (as defined in the Basin Plan) is not attainable in the foreseeable future with current applicable technology. The proposed amendment has been amended to include Freshwater Habitat but not include fish and other ph and metal sensitive species.

Complying with regulations is a responsibility of all answerable parties. The cost of "attaining water quality objectives Is not an "unnecessary expenditure of resources" and current technology is available to do so. The attainment of these objectives is required by all responsible parties at all properties owned and the argument that exempting one area will allow "available resources to be allocated on more serious water quality issues" is invalid. A property owner must use resources to comply with regulations despite the number of properties owned, therefore the property owner is required to deal with all water quality issues and not pick and choose which ones should be exempt and which ones require more remedies. If the amendment is approved it will open the door for all other mines covered under the Basin Plan to use this same method to become exempt from water quality objectives.

Staff disagrees technology is available to attain the water quality objectives necessary to support a fishery and spawning. Regional Board staff has worked for years on reducing ARD discharges to watercourses. Great strides have been achieved in reducing metal loading to West Squaw Creek and to Spring Creek at Iron Mountain Mine. However, it is not expected these watercourses will ever support a fishery or spawning in the affected areas. This is supported by the data presented in the UAA. If owners of mines along

other similarly impacted watercourses can demonstrate they have implemented BMPs, achieved 99 percent removal of metals from point sources (as stated in their NPDES permits), and can demonstrate through a UAA that certain beneficial uses do not currently exist, have not existed in the watercourse since November 28, 1975, and will not exist in the foreseeable future, they may be able to request the Regional Board modify the beneficial uses of the watercourse.

1.1.4 Since the Basin Plan "does identify present and potential uses for Shasta Lake, to which WSC is a tributary" it is important that the proposed amendment not be implemented in order to protect the beneficial uses for Shasta Lake and the downstream waters.

The beneficial uses currently assigned to Shasta Lake and the Sacramento River downstream remain in place and will be fully protected. The proposed Basin Plan Amendment does not adversely impact downstream water quality.

..the seasonal flooding of the creeks and Sacramento River allowed for dilution of acidic waters. Following construction and filling of Shasta Dam ... resulted in fish kills..."

This citation is taken out of context. The full citation is listed below (page 6, third paragraph of the Staff Report).

“Early prospectors used naturally occurring ARD as an exploration tool to locate mineralized deposits; however, this naturally occurring ARD was not well documented in the West Shasta Copper Mining District. The impact of ARD on the creeks of the West Shasta Copper Mining District was first documented in 1939. At that time, the seasonal flooding of the creeks and Sacramento River allowed for dilution of acidic waters. Following construction and filling of Shasta Dam, completed in 1945, fish kills were documented from ARD in the vicinity of the West Shasta Copper Mining District. These included fish in the West Squaw Creek arm of the lake immediately adjacent to the mouth of West Squaw Creek. Since 1939, attention has been directed at reducing ARD impacts in Shasta Lake and in the Sacramento River below Shasta Dam.”

There is no implied or stated meaning that Shasta Dam is responsible for fish kills. This paragraph simply states the facts. Staff recognizes there were fish kills in the streams before Shasta Dam was constructed and they continued after Shasta Dam was constructed. Remedial activities at the West Squaw Creek mines has virtually eliminated fish kills at the mouth of West Squaw Creek.

Given the length of time it took to complete the UAA, 1998 to 2004 (6 years), it is reasonable that much more data could have been collected and a stronger justification written. The UAA presented is lacking in engineering studies and data to support the action requested. Additionally, it could be presented that during this time period, knowing the RWQCB supported this action that new technologies have not been examined during these past 6 years. Since WSC is a tributary to Shasta Lake and the Sacramento River, have modeling studies been performed to show if there would be any impacts to freshwater fisheries and spawning in Shasta Lake and the Sacramento River?

Data is presented in the UAA up through October 2003. The UAA also contains a list of applicable technologies, many of which have been applied. The proposed Basin Plan Amendments will not adversely impact water quality in Shasta Lake or the Sacramento River. See response to l.c. above.

Past and probable future beneficial uses cannot be ruled out. The USEPA found historical evidence that gilled animals inhabited the creeks near the WSC area. In the absence of data a conclusion cannot be made that fish never inhabited WSC prior to mining operations. In section 1.1.4 it states "Following construction and filling of Shasta Dam ... resulted in documented fish kills in the vicinity of the West Shasta Copper-Zinc District.." This statement verifies that fish inhabited the creeks in the past. Since significant improvements to water quality in the WSC have been made it is reasonable to conclude that fish can inhabit this area in the future if improvements continue to be implemented.

Documentation shows fish have not inhabited the stretch of West Squaw Creek under discussion on or after November 28, 1975, the date by which uses are considered "existing" in the Federal Water Quality Standards contained in Title 40 Code of Federal Regulations (40 CFR) Section 131.3. The statement that USEPA found historical evidence that gilled animals inhabited the creeks **near** the WSC area does not indicate that fish inhabited the impacted portion of West Squaw Creek under discussion. The fish kills documented in Shasta Lake at the mouth of West Squaw Creek does not mean fish inhabited the creek. These fish were from Shasta Lake, attempting to enter the tributary. Lastly, although significant improvements have been made in water quality, the data presented in the UAA shows it is unreasonable to believe metal concentrations from the remaining diffuse sources can be reduced sufficiently to support fish and other pH and metal sensitive aquatic species.

Amending the Basin Plan will affect "the edge of the mixing zone" and would make water quality objectives difficult to meet in this area. The overall levels of copper in Shasta Lake continue to rise with time. The amendment will not confine the pollution to the mixing zone. The entire lake becomes one mixing zone for all the tributaries. Again, if

this amendment is passed it will provide an opportunity for all mines around Shasta Lake to apply for amendments to the detriment of the overall "main water mass".

The proposed Basin Plan Amendments will not result in increases in metals to Shasta Lake. Further, there is no evidence that the “overall levels of copper in Shasta Lake continue to rise with time”. The metal loads from the impacted tributaries, including West Squaw Creek, has significantly reduced with time due to continued remedial activities at the mines. The metals distribution in Shasta Lake do not extend to the “entire lake” or the “main water mass”. The metals distribution is limited laterally and vertically as shown in the Regional Board Staff Report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003.

1 2.5 The "methods for modifying water quality standards and water quality-based permit limits in effluent-dependent streams "have not been met by MRRC to date. It is premature to apply for an amendment until these methods have been implemented.

West Squaw Creek is not an effluent-dependent stream. The volume of discharge from the mines is a very small portion of the volume of flow.

The CWA requires that all mine portals be sealed and monitoring be conducted to ensure that no AMD is escaping the seals. This has not been successfully completed to date. On some of the newer seals there is not enough monitoring data to document that the seals are effective. The CWA has monitoring requirements that must be met before sealing of portals is considered complete and successful. Passage of the amendment will exempt MRRC from continuing improvement and monitoring.

Maintenance, monitoring, and continued implementation of BMPs is required by the NPDES permit issued to MRRC (See response to 1.c. above.) The CWA does not require all portals be sealed and that “no AMD is escaping the seals”. There is a requirement for implementation for reasonable and effective best management practices be implemented. The NPDES permit requires the remedial activities at the portals to be reduced by 99 percent. If a particular seal does not meet this requirement, additional remedies are required.

Some of the waste rock piles have had no BMPs implemented and there are no plans to implement any due to cost and alleged lack of technology.

This is not correct. MRRC is required to implement BMPs on all significant sources of AMD, including waste rock piles. See response to 1.c. above.

With passage of this amendment BMPs will be voluntary and there will be no regulations to, ensure BMPs are being implemented.

This is not correct. See response to 1.c. above.

Leaving the site as it is will cause more environmental harm than using current technology to clean it. The technology exists for the remedies required to protect the environment. The remoteness and steep slopes of the site does not rule out the technology available. It does mean the remedies will cost more money, which is not a factor to be taken into account to be exempted from environmental regulations.

There is no proposal to leaving “the site as it is”. However, it is impossible to control all sources of ARD. Regardless, continued implementation of BMPs will still be required (See response to 1.c. above).

2.2 Sites studies conducted from 1968 to 1969 in WSC. "The study ... addressed the seasonality of fish kills and suggested remedial efforts." This shows evidence of past fish use.

The fish kills documented were at the mouth of West Squaw Creek in Shasta Lake. No fish were documented in reach of West Squaw Creek under discussion. This was prior to any remedial activities at the mines when the and the pH and metals concentrations were much higher than today.

In many places of the UAA it is claimed that the amendment will not affect Shasta Lake and the downstream waters. According to one account by Hansen and Weidlein the "toxic copper concentrations extend a minimum of 1, 645 meters into Shasta Lake from the mouth of WSC". This further concludes that drainage from WSC does and will continue to affect the water quality of Shasta Lake and the Sacramento River.

Staff agrees. However, the proposed amendment will not result in increases of metal, including copper, to Shasta Lake and the Sacramento River. See response to 1.c. above.

The U.S. Geological Survey prepared a report in 1978 to evaluate the problems of acid rock drainage (ARD) that suggested "that waste rock piles may contribute significantly to metals concentrations". In 1983 Department of Water Resources (DWR) "conducted a detailed evaluation of ARD in the WSC drainage." Despite having knowledge of the impact of waste rock piles in the area BMPs have not been implemented on all of them (a requirement of the CWA).

Control of acid rock drainage from waste rock piles continues to be monitored and BMPs will be required as necessary. See response to 1.c. above.

2.3.1 BAT must be completed with a certain amount of monitoring data before a beneficial use can be removed by amendment, even if the BAT is not "economically achievable", Since BAT has not been completed this amendment cannot be considered according to the CWA.

Data presented in the UAA show that the average copper concentrations at the West Squaw Creek Bridge after the remaining significant sources of ARD are addressed this summer (Keystone blowout and Upper Windy Camp Portal), will still be approximately 50 ppb from diffuse sources, an order of magnitude above the 5.6 ppb protective of salmonids. Thus, the watercourse will still not support fish and other metal and pH sensitive aquatic species. Additional appropriate BMPs will be implemented and monitoring will continue under the current NPDES permit.

2.4.1 The weirs and continuous recording stations that were installed in 2003 have not provided enough data to determine if the requirements of the CWA have been met. It is premature to amend the Basin Plan based on these data.

The voluminous monitoring data from the past years is adequate to demonstrate the watercourse will not, in the foreseeable future, support a fishery.

2.4.3 Since the Shasta King Bulkhead seal replacement just took place in 2003 this does not provide enough data to determine if the requirements of the CWA have been met. It is premature to amend the Basin Plan based on these data.

See response to comment 2.4.1 above.

2.4.4 Since weirs and continuous recording stations were installed in the Windy Camp Area in 2003 this does not provide enough data to determine if the requirements of the CWA have been met. It is premature to amend the Basin Plan based on these data.

See response to comment 2.4.1 above.

2.4.5 The remote Keystone Bulkhead seal is still discharging 50% of the pre-plug levels. The CWA has not been complied with. It is premature to amend the Basin Plan based on this.

See response to comment 2.4.1 above.

2.4.6 If the amendment is passed the issues addressed here will not be regulated, but will be voluntary. There is no assurance this work will be completed. This work should be completed prior to consideration of an amendment according to the CWA.

The issues addressed (additional implementation of appropriate BMPs, additional monitoring, etc) is **required**, not voluntary. See response to 1.c. above.

2.4.7 "Remedial activities conducted between 1980 and 2003 have reduced copper loading in WSC ... approximately 92%." Given the additional work that MRRC plans to do the percentage of copper loading can be expected to rise from 92% and result in possible compliance with the current Basin Plan requirements. This information proves that there is more remedial work that can improve the water quality in WSC. Excellent progress has been made and the information shows more work is planned in the future. Amending the Basin Plan is premature at this stage and would encourage other mines in the area to apply 'for amendments to avoid additional costs of remedies.

Even with additional work and remediation of the remaining significant sources of ARD, the watercourse will still not support fish and other metal and pH sensitive aquatic species. See response to comment 2.3.1 above. Even if the owners of other mines wish to proposed similar Basin Plan Amendments they still have to implement all appropriate BMPs to remediate the discharges. There is no avoidance of costs of practical remedies.

2.5.1 "Additional reductions will be realized when discharge from the Keystone blowout and seepage from the Upper Windy Camp portal are addressed. " If the Basin Plan is amended there is no incentive to continue this work and ensure it is completed.

See response to 1.c. above.

Table 2-6 The metals concentrations have been improving significantly since the remedies were implemented. The sample sets are small so it is hard to determine if these numbers are truly representative. More data are required before a decision can be made.

Table 2-6 is not the entire data set. Data summarized in the UAA is presented in the Water Quality Appendix to the UAA and is quite large. Furthermore, continued monitoring is required in the NPDES permit for MRRC and Regional Board staff will continue to monitoring metal distributions in Shasta Lake.

The pH levels from 1999 to date are excellent. Again an amendment to the Basin Plan is not required.

pH is not the only condition that can be fatal to fish and other metal and pH sensitive aquatic species. Metals, specifically copper, zinc, and cadmium, are the constituents that are toxic to fish in the West Squaw Creek watercourse.

3.3.1 "All of these mineralized areas would have contributed natural acidity and metals loading to WSC prior to mining." This claim cannot be made since there are no data to verify or confirm it.

The comment simply recognizes that oxidation of sulfide minerals is a natural process that would have occurred to a limited extent prior to mining. There is no claim as to the extent or impacts of ARD prior to mining.

"The most highly mineralized areas in the WSC watershed have been mined, with obvious disturbance to the surface. This makes it difficult to determine natural background water quality. ...water quality samples collected from non-mined areas ... exhibit slightly elevated metals concentrations." These data are not presented in the UAA, even so it does not eliminate the fact that human disturbance caused the water quality problems and the site needs to comply with federal and state regulations.

The data is presented in a Table titled "Water Quality Data, Areas Undisturbed by Mining Activities" collected by Shepard Miller, 1996). Staff Agrees this does not eliminate the fact that human disturbance cause the water quality conditions and the site needs to comply with federal and state regulations. Thus the use of the UAA to demonstrate that attaining the designated use is not feasible because of "Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place", 40 CFR 131.3.

3.3.2 This information does not eliminate the fact that human disturbance caused the water quality problems and the site needs to comply with federal and state regulations.

Regional Board staff agrees

3.4.1 This section verifies the stream has good and excellent physical habitat scores. With extra remedies this stream does have potential future beneficial uses for WARM, COLD and spawning.

Staff agrees that if the stream was not impacted by ARD, it would support fish and other metal and pH sensitive aquatic species. However, based on an evaluation of the data and site conditions, remaining diffuse sources of ARD to stream will not allow for support of fish or other pH and metal sensitive aquatic species despite the continued, required implementation of BMPs.

3.4.2 This section verifies that the only inhibitors of fish life in the stream are the mining waste constituents. With extra remedies this stream does have potential future beneficial uses for WARM, COLD and spawning.

Based on the available data and site conditions, even with full implementation of available BMPs, remaining diffuse sources of ARD will still not support of fish and other pH and metal sensitive aquatic species.

Table 3-3 With improvement of the causes of elevated metals concentrations at sites WSC-3 to WSC-5 this stream could potentially support fish.

See response to comments 2.3.1 above.

3.5.1.3 There are general questions about the fish sampling. Were block nets installed? If not fish at the fringe of the shock area feels the shock waves and will actually swim away from the direction of the electroshocker. For example; fish can feel the shock waves put out by an electroshocker, if block nets are not placed to catch these fish they will actually swim away from the electroshocker. If block nets are not installed many aquatic species could be missed. The person with a dip net can only scoop up the fish affected by the electroshocker because these fish, are stunned. Why were sampling sites inaccessible? Why weren't other sites more accessible substituted? Why weren't the numbers of trout/salamanders found listed? Why was there only one sampling event in the past 6 years (since the RWQCB requested the UAA)? Where are the data showing the measurements taken of the fish found? The document states that measurements were taken of the fish. What affect does not having data for sites WSC-6 and WSC-7 have on the overall assessment? Was a Sampling Plan written and followed? Were QA/QC and QA Project Plans written and followed?

The sampling was carried out by staff from the California Department of Fish and Game who are quite knowledgeable and experienced in sampling techniques. The sampling followed methodologies described in the following documents which are included in the reference list at the back of the UAA.

Harrington, J.M. 1999. *California stream bioassessment procedure*, California Department of Fish and Game, Water Pollution Control Laboratory. Rancho Cordova, CA.

Davis, W.S., B.D. Syder, J.B. Stribling and C. Stoughton. 1996. *Summary of state biological assessment programs for streams and wadable rivers*. EPA 230-R-96-007. U.S. Environmental Protection Agency; Office of Policy, Planning, and Evaluation: Washington D.C.

The reference for entire report is California Department of Fish and Game. 2001. *Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities* and is available for review.

3.5.2 Of the 6 sites below confluences 1 states "No fish were identified..." Either this is a typo or fish were found but not identified, "No fish were observed at this site" was noted for 2 of the sites and the last 2 sites were deemed "not accessible". This information does not rule out a potential beneficial use of WSC for fish.

Table 7, page 17 of the report titled *California Department of Fish and Game. 2001. Fall 1999 biological assessment of Little Backbone Creek and West Squaw Creek, Shasta County California: Analysis of periphyton, benthic macroinvertebrates and fish communities* shows no fish were found at any of the lower sampling sites.

Table 3-5 Rainbow trout and Pacific Giant Salamanders were found at the background and the WSC-2 biological assessment sampling points. At the WSC-3 sampling site the results say "No fish were identified at this site". At the WSC-4 and WSC-5 sites it states "No fish were observed at this site", There is a discrepancy between the words "identified" and "observed". Does this mean there is a typo, or does one conclude that fish were observed at WSC-3 but not identified? Sites WSC-6 and WSC-7 were not accessible for sampling. Figure 3-1 shows WSC Bridge at the mouth of the tributary entering Shasta Lake. If there is a bridge, the site should be accessible and samples should have been taken here. All sites contained periphyton and benthic organisms (organisms that fish eat). There are fish in Shasta Lake and a conclusion could be made that if fish were found at the first site and at the mouth of the tributary that further remedial actions would clean the creek enough to support fish. It appears that this sampling was only conducted one time and if MRRC had 6 years to complete this UAA many more sampling events should have taken place in order for there to be enough data to form any conclusion. Also sampling events should have been conducted at a minimum of once each season (spring, summer, winter, and fall).

The studies were designed and conducted by staff from the California Department of Fish and Game. The full report is available as described in the response to 3.5.1.3. No fish were present below WSC-2. The proposed Basin Plan Amendments are not based on a

single study, but on an evaluation of the entire physical, chemical, and biological conditions in the watercourse and described in the full UAA.

4.0 Cannot remove the designated beneficial uses for support of WARM, COLD, and spawning when Rainbow trout and salamanders were present at one of the sites sampled. The presence of aquatic life demonstrates that the beneficial use does exist.

The proposed Basin Plan Amendment has been modified to keep the beneficial use for support of freshwater habitat (COLD, WARM) with a footnote stating “Cold And Warm Freshwater Habitat does not include fish or other metal and pH sensitive aquatic species in West Squaw Creek from Early Bird Tributary to Shasta Lake”. Spawning, as defined in the Basin Plan includes only Stripped Bass, Sturgeon, Shad, Salmon and Steelhead. These fish do not spawn in the lower reaches of West Squaw Creek.

The variable stream conditions and metal concentrations are not consistent in the watercourse, especially in the lower flow conditions found in the upper reaches. It is therefore not reasonable to assume that conditions below the Early Bird Tributary will always be favorable for long term residence of fish due to variable concentrations of metals. Therefore, this stretch was included in the proposed amendment. Regardless the state Anti-degradation Implementation Policy requires no-backsliding of water quality.

5.3.1 Documentation in this section does not demonstrate that any engineering work was performed to substantiate the claims made.

The comment is not specific as to what engineering work or claims are referred to.

Table 5-4 This table shows BATs and BMPs that are available but have not been implemented which is required per the CWA before an amendment to the Basin Plan can be proposed.

There are a few remaining sources of ARD that will be addressed this summer. Further, BMPs will continue to be applied as necessary to remediate significant sources of ARD. As new BMPs become available, they will be required to be implemented. However, even when all significant sources are remediated, the data shows the watercourse will still not support include fish or other metal and pH sensitive aquatic species in West Squaw Creek from Early Bird Tributary to Shasta Lake. See response to 2.3.1 above.

Mass Loading Summary - "Additional reduction will be realized when discharge from the blowout and the Upper Windy Camp portal are routed through a treatment unit. This

demonstrates that improvements can continue to be made in an effort to meet water quality objectives. Amending the Basin Plan is premature.

See response to 2.3.1 above.

Concentration Summary - Continuation of the "consistent downward trend" of annual dissolved copper, cadmium and zinc concentrations demonstrate that improvements are still being made. There is no need to amend the Basin Plan based on this information.

See response to 2.3.1 above.

Comments to Staff Report

1. 1. 3 Achieving water quality objectives is feasible. Documentation has not proved that compliance is not attainable. Achieving water quality objectives is necessary. The water from WSC enters Shasta Lake and would affect many downstream operations such as: 1) the ability of other Shasta Lake and Sacramento River water users to meet Basin Plan requirements by increasing the amount of constituents currently in the water such as the 5.6 ug/L copper limit, 2) Impair the ability to use Shasta Lake water for dilution of Spring Creek Debris Dam discharges (an existing cooperative agreement between USEPA and Reclamation), 3) Affect the operation of the Shasta Temperature Control Device (TCD), a CEQA requirement for downstream fisheries, and 4) less water will be available from Whiskeytown Lake for SCDD discharges now that more water is required for Trinity River flows (ESA) which means Shasta water may be the only available water for SCDD dilution. If the water coming out of Shasta is 4 ug/L, for example, dilution cannot be achieved and the Basin Plan will be exceeded. Shasta copper levels continue to rise and passing the amendment to the Basin Plan will impact this significantly. In addition it will open the door for other mines in the Shasta area to apply for amendments thereby greatly impacting Shasta water quality.

The data demonstrates that achieving water quality objectives is not feasible. See response to 2.3.1 above.

Metals concentrations discharging to West Squaw Creek, Shasta Lake and the Sacramento River will not increase as a result of the proposed amendments. Water quality in West Squaw Creek will not be allowed to backslide as required by the State Antidegradation Implementation Policy as described in section 5.3.4 of the Staff Report. MRRC will still be required to implement BMPs (See response to 1.c. above). Metals concentrations in Shasta Lake are not rising, but the metals exiting the dam into the Sacramento River

There is no data to show the copper concentrations in Shasta Lake are rising. See response to 1.1.3 above.

The fact that MRRC is not in compliance does not mean "it is not necessary to continue to require compliance with water quality objectives". If all entities that were out of compliance were to use this argument it would defeat the purpose of having environmental regulations.

Staff agrees that simply being out of compliance is not an argument to support the proposed amendment. The data contained within the UAA demonstrate the proposed amendments are justified due to the reality that water quality objectives adequate to protect fish and other pH and metal sensitive aquatic species are not attainable. MRRC is still required to implement current appropriate BMPs and new ones as they become available. See response to 1.c. above.

1. 1.4 It is not applicable to site "naturally occurring sources" as part of the non-point sources on the site. There is no way to know what the naturally occurring amounts would be. There are no data to substantiate this claim.

Naturally occurring sources undoubtedly occur, although they are difficult, if not impossible to quantify. However, their presence is included in the report for completeness.

1.2.6 In order to qualify for an amendment according to the CWA all BATs and BMPs must be implemented and monitored. This has not been completed making the amendment premature.

See response to 2.3.1 above.

1.2.8 In order to qualify for an amendment according to the CWA all BATs and BMPs must be implemented and monitored. This has not been completed making the amendment premature.

See response to 2.3.1 above.

3.3.1 This alternative is the one that is most protective of Shasta Lake and Sacramento River water quality.

The beneficial uses are assigned based on current and **potential** future uses. The UAA demonstrates that the attainment of water quality adequate to support of fish and other

metal and pH sensitive aquatic species in not possible in the foreseeable future with available technology.

3.3.2 There are many remedial activities that can be implemented now. MRRC even sites several of them. The only justification shown as to why they have not been implemented is cost which is not a consideration for an amendment to the Basin Plan.

MRRC will be required to continue to implement remedial activities, however attainment of the current objectives is not possible with currently applicable technology. See response to 2.3.1 above.

3.3.3 This alternative would adversely affect Shasta Lake and the Sacramento River. It would also affect the following Reclamation operations: 1) reduce ability to meet Basin Plan objectives (even, though Reclamation does not own any mining properties). 2) -Reclamation and USEPA have an agreement to manage discharges from the SCDD by diluting the discharges with Shasta Lake water. This is not possible when the water from Shasta Lake is already near Basin Plan levels, 3) TCD operation, 4) will make dilution of SCDD discharges more difficult since less water is available because of Trinity River fisheries flow requirements.

The proposed Basin Plan Amendment will not adversely impact current water quality. Continued remedial activities in West Squaw Creek and other tributaries will result in an overall reduction of metal loading to Shasta Lake and the Sacramento River.

3.4

1. This alternative is not consistent with state and federal water quality laws and policies. The CWA requires all BATs and BMPs be implemented before an amendment is considered. All BATs and BMPs have not been completed.

See response to 2.3.1 above.

2. This is not protective of current and post 1975 water quality uses (data have not been provided to demonstrate there is no beneficial use for fish) and improvements in water quality attained since 1975 (with the amendment passed all requirements become BMPs which are voluntary and are not regulated or enforced).

The data provided in the UAA clearly show West Squaw Creek has not been able to support fish and other pH and metal sensitive aquatic species since 1975. Implementation of future BMPs is a **requirement** of the NPDES permit for MRRC. This is **not** voluntary. See response to 1.c. above.

3. Technology does currently exist. MRRC even documents remedies that are available but not feasible due to cost (which is not a factor according to the CWA).

Many factors are included in evaluating applicability of remedial alternatives. Best Professional Judgment, applicable technologies, environmental damage from the remedies, Best Available Technology economically achievable, etc. Current available technologies are not adequate to reduce metal loading from all remaining diffuse sources of ARD to a point where the watercourse will support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above.

4. The RWQCB is still required to "reasonably address regulatory issues associated with abandoned mine site remediation" whether or not this amendment is passed. The only entity that stands to gain anything is MRRC by saving money by avoiding implementing remedies. If the amendment is passed other mines can file for amendments which will further impact Shasta Lake and the Sacramento River.

Staff agrees the Regional Board and MRRC are required to “reasonably address regulatory issues associated with abandoned mine site remediation” whether or not this amendment is passed. There is no avoidance of costs by MRRC, they are still required to continue to implement applicable BMPs. Owners of other mines will also be required to implement applicable BMPs, regardless of the assigned beneficial uses. See response to 1.c. above. The proposed amendment recognizes the reality the remedial activities will not reduce metal loading to a point where the watercourse will support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above.

5. Responsible parties are legally required to focus efforts on all sites. This is not a valid reason to exempt a responsible party from meeting the Basin Plan objectives.

Staff agrees. The proposed amendment recognizes the reality the remedial activities will not reduce metal loading to a point where the watercourse will support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above.

Current science does support feasible remedies for the types of issues at the WSC area.

The UAA evaluates currently available remedies and concludes that even with their implementation, the remedial activities will not reduce metal loading to a point where the watercourse will support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above.

3.4.2 The UAA has not provided sufficient data to prove there is not a beneficial use for fish. With the great improvements that have been made at the site it is incorrect to say there is no potential beneficial use, especially when fish and salamanders were found at one site, plus insufficient data are available to prove there are no fish. The habitat quality is excellent at all but one site which was rated as good. Implementing the required BATs and BMPs will further improve water quality increasing the likelihood of fish to populate the stream.

Staff agrees that implementing required BMPs will further improve water quality, however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above.

In regards to Finding No. 18, Spring Creek discharge is still managed under the Basin Plan; remedies for the removal of the contaminated sediments are currently being investigated by USEPA with cooperative help from several other state and federal agencies. There is no current funding to pay for the sediment removal, yet in order to meet Basin Plan objectives and to improve the environment this action is being explored despite technological challenges.

Comment noted.

3.6 'Available data, best professional judgment, and evaluation of BPT/BMP/BAT indicate that the immediately technically feasible future beneficial uses of WSC would be the same as the existing beneficial uses.' The available data are lacking, much more is needed to make a determination that would impact an entire lake and all the downstream waters. Best professional judgment should have included best professional engineering, which according to the UAA was not completed. Evaluation of the BPT/BMP/BAT indicates that there are still measures to implement before an amendment can be made to the Basin Plan according to the CWA.

The UAA evaluates currently available remedies and concludes that even with their implementation, the remedial activities will not reduce metal loading to a point where the watercourse will support fish and other metal and pH sensitive aquatic species. See response to 2.3.1 above. Further, the discharges from the mines do not “impact an entire lake”. The lateral and vertical extent of the metals is limited as shown by work done by Regional Board staff and documented in the Regional Board Staff Report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003 (See response to 1.1.3 above).

4.1 If the Basin Plan were to be amended then the requirements for the WSC would change from 5.6 ug/L (Basin Plan) to 1000 ug/L (requirement for other uses identified).

This would greatly impact the water quality of Shasta Lake and the Sacramento River. There would be no requirement or incentive for MRRC to implement further controls to discharges.

The next most restrictive numeric standard for copper is 1,000 ug/l, the secondary MCL for copper in drinking water. Although this numeric standard was included in the report for completeness, no backsliding on current water quality will be allowed as required under the Antidegradation Implementation Policy (see section 5.3.4. of the Staff Report). MRRC will still be regulated under a NPDES permit (See response to 1.c. above) which requires implementation of BMPs and maintenance of current water quality.

4.2.2 Amendment of the Basin Plan would affect the downstream water bodies since WSC is a tributary to Shasta Lake and flows into the water body.

No backsliding on water quality will be allowed as required under the Antidegradation Implementation Policy (see section 5.3.4. of the Staff Report). MRRC will still be regulated under a NPDES permit (See response to 1.c. above) which requires implementation and maintenance of BMPs.

4.2.3 All the BAT and BMP remedies have not been implemented making an amendment to the Basin Plan premature at this time according to the CWA.

MRRC is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

Raising the level of copper from 5.6 ug/L to 1000 ug/L will adversely affect the downstream water bodies and is not protective of the down stream water bodies beneficial uses.

The copper limit for the watercourse is not being raised from 5.6 ug/l to 1,000 ug/l. Although 1,000 ug/l is the next most restrictive numeric standard for the protection of drinking water, no back-sliding on current water quality is allowed (See response to 4.2.2 above).

MRRC and any other discharger in the watercourse is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.). Further, as stated in the draft resolution containing the proposed Basin Plan Amendments, the NPDES permit for MRRC will be modified to assure no increases in metal loading occur.

4.2.4 Steep terrain does not eliminate available remedies at the site. It does make the remedies more costly but this does not exempt a responsible party from completing required BATs and BMPs according to the CWA.

Accessibility, implementability and economics are factors to consider along with environmental impacts from the remedies when selecting BMPs. If the solution is more damaging than the problem, this must be taken into account. As an extreme example, one possible remedy would be to remove all sulfide bearing minerals from the watershed. This would entail removal of millions of yards of material, would disrupt the majority of the watershed take tens of years to accomplish and cost billions. The removal, transportation, and disposal of the material would result in massive, unacceptable impacts to land, water, and air. Such a solution is not economically achievable, is more damaging to the environment than the current problem, and is clearly not in anybody's best interest.

It is incorrect to claim that "No external economic effects are expected to be incurred by the local public, MRRC, or any other parties as a result of adopting the proposed beneficial uses". There will be a cost to the public. Treatment plants, Reclamation, USEPA and other dischargers in the area must comply with the 5.6 ug/L Basin Plan requirements. By allowing MRRC to be exempt from the more stringent objective the costs will rise for all other parties and those costs will be passed on to the water users. Additionally, other environmental regulations (ESA, CEQA, CWA, etc.) will be impacted and potentially violated if the Shasta Lake water exceeds the 5.6 ug/L objective.

There will be no increase of metals in Shasta Lake. MRRC is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.) Further, USEPA is not required to meet the 5.6 ug/l number in the drainages at Iron Mountain Mine. Only by diluting water from Spring Creek Debris Dam with water from Shasta lake can the Sacramento River meet these objectives.

1) If the discharges from WSC are changed from 5.6 ug/L of copper to 1000 ug/L this will impact the level of water quality necessary to protect the beneficial uses of Shasta Lake and the Sacramento River.

The metal concentrations in West Squaw Creek will not be allowed to increase at all, let alone increase to 1,000 ppb. MRRC and any other discharger in the watercourse is required to continue to implement BMPs and achieve a 99 percent removal of metals from point source discharges, all which will further improve water quality (see response to 1.c. above). No backsliding on water quality is allowed (See response to 4.2.2 above).

However the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

2) If the overall water quality exceeds the Basin Plan objectives due to this change this section sounds as if the other entities meeting the Basin Plan requirements will have to compensate for the WSC discharges, or the state will lower water quality standards if it "is necessary to accommodate important economic or social development in the area in which the waters are located ... Further, the State shall ensure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for non-point source control" (this would not include WSC because they would be exempt - so would these requirements fall upon the remaining entities that are meeting Basin Plan objectives if not for the high levels of constituents mixing into Shasta Lake and the Sacramento River?)

MRRC is not exempt from implementing "all cost-effective and reasonable best management practices for non-point source control". MRRC and any other discharger in the watercourse is required to continue to implement BMPs which will further improve water quality. This is mandatory not voluntary (see response to 1.c. above). However the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

There will be no incentive for MRRC to continue with BMPs as they will be voluntary with no regulatory oversight. Technology is currently available to reduce discharges from WSC but MRRC has repeatedly documented cost as being a prohibiting factor. If MRRC is not willing to spend the money now and has stated that the amendment will allow the money to be spent in other areas of the watershed does this not show that MRRC has no intention of implementing new remedial measures even if available (and they are) and the cost goes down.

MRRC is not exempt from implementing "all cost-effective and reasonable best management practices for non-point source control". MRRC and any other discharger in the watercourse is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

5.2.2 The amendment will result in overall degradation of downstream water bodies water quality.

MRRC and any other discharger in the watercourse are required to continue to implement BMPs which will further improve water quality (see response to 1.c. above).

Not implementing the amendment will ensure measures will be carried out in an effort to comply with the Basin Plan objectives. Amending the Basin Plan will decrease the incentive to improve water quality at WSC.

MRRC and any other discharger in the watercourse are required to continue to implement BMPs which will further improve water quality (see response to 1.c. above).

5.2.4 This is not a valid point as all responsible parties are responsible for all site(s) remediation. Granting this amendment will encourage other mines in the area to file for the same amendment.

Staff agrees that all responsible parties are responsible for all site(s) remediation. This includes MRRC (see response to 1.c. above). If other mines in the area can demonstrate they have implemented BMPs, achieved 99 percent removal of metals from point sources (as stated in their NPDES permits), and can demonstrate through a UAA that certain beneficial uses do not exist and have not existed in the watercourse, and will not exist in the foreseeable future, then the law allows for the RWQCB to consider modifying the Basin Plan. As with MRRC, the level of proof is very high, but the reality is that not all watercourses will support all beneficial uses. Congress recognized this when developing the concept of performing a UAA to allow for removal of designated, but not existing beneficial uses.

5.2.5 Under the amendment the remedies will be purely voluntary. There will be no regulatory authority. The data provided do not support the claim that WSC does not have a potential beneficial use for aquatic life.

See response to 1.c. above. Staff agrees the watercourse does support some aquatic life. Based on discussions with USEPA, the beneficial uses for Freshwater Aquatic Habitat (WARM and COLD) remain but have been modified to include the statement “Cold And Warm Freshwater Habitat does not include fish or other metal and pH sensitive aquatic species in West Squaw Creek from Early Bird Tributary to Shasta Lake”

Technology currently exists but the remedies have not been implemented, not even the required BATs and BMPs have been completed, required before an amendment to the Basin Plan can be approved.

See response to 2.3.1 above.

5.3.2 The proposed amendments do impact water quality. The levels of copper in Shasta Lake are rising, not going down. At times the levels in Shasta Lake meet or exceed the Basin Plan objectives. This is without an amendment. The water quality will degrade if an amendment is passed.

There are no data to show the copper concentrations in Shasta Lake are rising. In fact, data from all the tributaries to Shasta Lake show the metals concentration, including copper, going down. The only data showing increasing concentrations of copper are **discharges** from Shasta Dam during the winter period. The available data shows this is an unintended result of the configuration of the Temperature Control Device (TCD). During the winter period, the TCD is configured to draw water from the upper water column, this is the area where the elevated copper concentrations are found. Before the TCD was in place, water was withdrawn from the dam at the level of the penstocks, which, except in periods of severe drought, is below the level when elevated concentrations of copper occur. See Regional Board Staff Report titled *Interim Report, Metal Distributions Within Shasta Lake, Shasta County, California*, dated May 2003

5.3.3 The proposed amendment will change the metals objectives considerably. Copper will change from 5.6 ug/L to 1000 ug/L. Under the amendment BMPs will be voluntary, not required. The current required BMPs have not yet been met, which is required for an amendment according to the CWA.

See response to 1.c and 2.3.1 above.

Data provided in the UAA do not rule out the potential for beneficial uses for fish.

See response to 2.3.1 above.

5.3.4 The water quality at WSC has been declining since 1999, which was a good year for this area, since that time the metal levels have been on the rise. This indicates that there is already a reduction of water quality from the documented past. This reduction can be expected to increase with less stringent requirements.

This is not a correct statement. Table 2-6 of the UAA contains a summary of the data for metal concentrations at the West Squaw Creek Bridge, immediately before entering Shasta Lake. The data runs from 1968 to 2003 and shows a steady reduction in metals entering Shasta Lake.

Technology currently exists but the remedies have not been implemented, not even the required BATs and BMPs have been completed, required before an amendment to the Basin Plan can be approved.

See response to 2.3.1 above.

7.2 The levels in WSC will continue to rise, which may or may not affect the current conditions that exist there, but the increase will affect beneficial uses of downstream water bodies.

See response to 5.3.4 above.

7.4 The Biological Resources box should be checked here, and depending on the metals and pH levels Hazards and Hazardous Materials.

Biological Resources will not be impacted by the proposed amendments as water quality will remain the same or improve. The pH and concentrations of metals are below hazardous thresholds. The proposed amendments will not result in an increase in metal concentrations in West Squaw Creek or Shasta Lake. The abandoned mines will remain under a NPDES permit which required continued implementation and maintenance of BMPs, and monitoring to assure metal concentrations in West Squaw Creek do not increase (see response to 1.c. above).

The data do not support the claim "that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared".

The proposed amendments will not result in an increase in metal concentrations in West Squaw Creek or Shasta Lake. The abandoned mines will remain under a NPDES permit which required continued implementation and maintenance of BMPs, and monitoring to assure metal concentrations in West Squaw Creek do not increase (see response to 1.c. above).

7.5.1.4 Biological Resources (a), (b), (d) and (f) should be marked "Yes

See response to 7.4 above.

7.5.1.7 Hazards & Hazardous Materials (a) and (b) might be affected depending on levels of metals and pH.

The pH and concentrations of metals are below hazardous thresholds.

7.5.1.8 Hydrology & Water Quality (a - yes) and (b - ?)

The proposed Basin Plan amendment is a water quality standard and, as such, cannot violate its self.

The amendments will not impact ground water quality or resources.

7.5.2 Findings (a=yes), (b=yes, especially if other mines get amendments also), (c-lack of fishing)

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above).

7.6.1 Downstream water bodies will be affected.

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above).

7.6.4 Impacts will occur. This amendment will open the door for other mines in the area to apply for the same amendment.

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above). If owners of mines along other similarly impacted watercourses can demonstrate they have implemented BMPs, achieved 99 percent removal of metals from point sources (as stated in their NPDES permits), and can demonstrate through a UAA that certain beneficial uses do not exist and have not existed in the past, and will not exist in the foreseeable future, they may be able to request the Regional Board modify the beneficial uses of the watercourse. Regardless, the proposed amendments will not allow for a degradation of water quality from what currently exists nor exempt the mine owners from being required to implement BMPs to reduce metal discharges.

7.6.7 Depending on how high the levels rise there are potential for hazards.

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above).

7.6.17 Downstream water bodies will be affected.

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above).

7.7 The amendment will affect the following Reclamation operations: 1) Ability to meet Basin Plan objective of water quality - particularly the copper concentration amount of 5.6 ug/L, 2) Temperature Control Device (TCD) operation, 3) dilution of SPDD acid mine drainage (AMD) with Shasta Lake water, 4) increased reliance of Shasta Lake water due to less water available from Whiskeytown Lake in order to meet fishery needs in the Trinity River per Endangered Species Act (ESA) requirements and the Central Valley Project Improvement Act (CVPIA), 5) overall operations of Reclamation's Central Valley Project.

The proposed amendments will not result in a degradation of water quality from what currently exists (See response to 1.c above) and will therefore not impact current Reclamation operations.

Passage of the amendment will open the door for other mines to also apply for amendments.

If owners of mines along other similarly impacted watercourses can demonstrate they have implemented BMPs, achieved 99 percent removal of metals from point sources (as stated in their NPDES permits), and can demonstrate through a UAA that certain beneficial uses in the watercourse do not exist and have not existed, and will not exist in the foreseeable future, they may be able to request the Regional Board modify the beneficial uses of the watercourse. Regardless, the proposed amendments will not allow for a degradation of water quality from what currently exists nor exempt the mine owners from being required to implement BMPs to reduce metal discharges.

7.8 Steep unstable and inaccessible topography and lack of utilities is not a valid reason to be granted an exemption from the Basin Plan objectives. There are many sites with the same situations that are employing current technology to remediate the waste.

Accessibility and implementability are considered when choosing applicable BMPs.

Table 7-1 This documents the BATs and BMPs that are not used yet are required under the CWA for a Basin Plan amendment.

MRRC is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

7.8.1 This is preferable to the other 2 alternatives (which are essentially the same). It is beneficial for the water quality of downstream water bodies to adopt a "No Action".

MRRC is required to continue to implement BMPs which will further improve water quality (see response to 1.c. above), however the incremental improvements will still not allow for the watercourse to support fish and other metal and pH sensitive aquatic species. (See response to 2.3.1 above.)

7.8.2 This alternative can be prolonged indefinitely and is essentially the same as alternative 3.

The evidence presented in the UAA demonstrates that the watercourse will not support fish or other metal and pH sensitive species now or in the foreseeable future. The proposed amendments recognize this reality. If, in the future, technology is developed where BMPs can be implemented to allow for the presence of fish and metal sensitive aquatic life, then the mine owners will be required to implement it. It is not efficient with staff time or resources to revisit an issue that has no solution in the foreseeable future.

7.9

1) The amendment is not consistent with federal and state laws and policies.

Chapter 5, Consistency With Federal And State Laws and Policies, contains a complete discussion of all applicable laws and policies. The proposed amendments comply with these.

2) The amendment is not protective of current and post 1975 uses. There are not enough data to rule out the possibility of potential aquatic life.

Staff agrees. The proposed amendment has been modified to include Freshwater Aquatic Habitat (WARM and COLD) but include the following qualifier "Cold And Warm Freshwater Habitat does not include fish or other metal and pH sensitive aquatic species in West Squaw Creek from Early Bird Tributary to Shasta Lake"

3) Technology does currently exist. The UAA has not proven otherwise.

Staff disagrees. The UAA, taken as a whole, has evaluated the current conditions of the watershed, including the physical, chemical, and biological parameters, evaluated current and proposed remedial efforts and BMPs. It concludes, correctly, that even when all identified sources of ARD are remediated, the watercourse will still not be capable of supporting fish and other metal and pH sensitive aquatic species.

4) This is not a valid claim.

Staff disagrees. The reality is that resources for remediation is limited and efforts must be directed towards areas where the most success can be achieved. Currently costs associated with incremental increases in water quality are quite high. By focusing efforts on larger sources of ARD, greater reductions in metal loading to Shasta Lake and the Sacramento River can be achieved, thus aiding all downstream users and improving aquatic habitat.

5) Responsible parties are liable for cleanup of all sites owned regardless of how many are owned.

Staff agrees. See response to 1.c. above.

Comments to Appendix B

Fisheries -. "WSC ... has not supported a fishery since mining began ... WSC is considered a 'dead' stream in most documents reviewed. The biological evaluation conducted by DFG for the UAA showed increases in macro invertebrates and return of fish to certain reaches." This paragraph is contradictory; if fish are found it cannot be considered a 'dead' stream. More sampling needs to be done before it can be said this area cannot sustain aquatic life. Furthermore, if a 'return of fish to certain reaches' was documented by DFG that would imply there were fish before mining operations began. This would mean WSC has a past beneficial use, and the presence of fish recently could mean there are present and potential future beneficial uses.

The reference to a “dead” stream is not a conclusion of the UAA or the appendix. This is simply a summary of documents reviewed. Staff agrees that remedial activities have allowed for the presence of aquatic species and the proposed amendments have been modified to acknowledge this. As for the “return” of fish”, there is no evidence of fish in the impacted reaches since mining began, and certainly not on or after November 28, 1975, the date by which uses are considered “existing” in the Federal Water Quality Standards contained in Title 40 Code of Federal Regulations (40 CFR) Section 131.3.

"Acid rock drainage continues to degrade portions of WSC." These portions of WSC should be examined and all BATs and BMPs should be implemented to improve those portions of WSC.

See response to 1.c and 2.3.1 above.

"Below Shasta Dam the Sacramento River is habitat for an anadromous fishery that includes five runs of Chinook salmon and steelhead. " Basin Plan water quality objectives are crucial for survival of this fishery. Since WSC discharges enter the Sacramento River the Basin Plan objectives should be applied to the discharges.

The fact that West Squaw Creek is tributary to Shasta Lake and the Sacramento River is not the test for assignment of beneficial uses. The test is "can the beneficial uses be obtained and did they exist on or after November 28, 1975,". The reach of the watercourse in question has not supported fish or other metal and pH sensitive aquatic species since November 28, 1975, and will not in the foreseeable future. The proposed amendment simply recognizes this fact.

Additional Comments of U.S. Department of Interior, Bureau of Reclamation (Mr. Frank Michny and Ms. Michelle Prowse)

The United States Department of Interior, Bureau of Reclamation submitted comments dated 22 April 2004 to the Regional Water Quality Control Board, Central Valley Region (Regional Board) on the proposed amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), and associated draft Staff Report and draft Use Attainability Analysis. These responses will address the 22 April 2004 letter and the enclosure titled "U.S. Bureau of Reclamation (Reclamation), Comments for Regional Board Hearing, April 22, 2004".

Reclamations comments are presented in *italics* below with Regional Board staff responses immediately following.

Page 1, 3rd paragraph

Shasta Lake waters have been exceeding the 1.3 ppb dissolved copper concentration at Shasta Dam. 1.3 ppb is specified as a target concentration for copper in the TMDL for the Upper Sacramento River. Prior to amending the Basin Plan, the TMDL issue should be addressed in an effort to meet the target concentrations.

The proposed amendments do not affect the TMDL for the Upper Sacramento River (full title of the document is *Upper Sacramento River TMDL for Cadmium, Copper & Zinc*) nor do they adversely impact metals concentrations in Shasta Lake or the Upper Sacramento River. The proposed amendments simply recognize that West Squaw Creek will not, in the foreseeable future, support fish and other metal and pH sensitive aquatic species. The Water Quality Objectives for cadmium, copper, and zinc for protection of sensitive species is being modified to reflect the reality that metal concentrations in West Squaw Creek from the Early Bird Tributary to Shasta Lake cannot be reduced to the levels that are protective of these species.

The Upper Sacramento River TMDL contains several references to the Shasta Lake Mines that either have been addressed or in the process of being addressed. The Draft UAA and proposed Basin Plan amendments are discussed in the TMDL (see Table 10-1, *Permit Types and Proposed Future Remediation Activities for Shasta Lake Area Mines*, in Chapter 10, Implementation).

Table 10-1 indicates that current and potential BMPs are to be evaluated, and that a UAA for removal of selected beneficial uses to West Squaw Creek will be developed. It also states that further remedial activities will be evaluated and implemented at the mines in the Little Backbone Creek Watershed, and at those mines draining to Horse Creek and Town Creek. These activities are currently underway.

The TMDL also states the Regional Board staff will “increase monitoring in Shasta Lake (e.g., at multiple depths and location[s] throughout the lake pool) to determine any additional metal sources and to better define metal transport in the lake. Regional Board staff will develop additional mine remediation and other activities as needed to address metal concentrations in Shasta Dam releases that exceed 1.3 ug/l dissolved copper and 3.9 ug/l dissolved zinc”. Regional Board staff has, and will continue to conduct such monitoring. Metals data gathered from Shasta Lake since 2002 has helped define the distribution of metals both vertically and laterally in the lake. A staff report titled *Interim Report, Metals Distribution Within Shasta Lake, Shasta County, California*, (May 2003) was issued and copies sent to both U.S. EPA and the Bureau of Reclamation. Further data has been gathered and another report will be issued shortly. This data is directly applicable to the evaluation of the copper concentrations passing through Shasta Dam. Further, Regional Board staff is recommending the owners of the mines in the West Squaw Creek watershed, after completing implementation of the last few available and applicable BMPs, move their emphasis to the mines in Little Backbone Creek, which is currently the largest source of metals to Shasta Lake. Successful remedial activities at these mines will significantly reduce the metal concentrations in Shasta Lake and therefore, those exiting Shasta Dam.

While the TMDL does state that 1.3 ppb of copper is the target for discharges from Shasta Dam, it must be noted that this is an **average** concentration provided by a model developed by EPA. Regional Board staff questions the applicability of the data used in the model as it was based on values obtained between 1994 and 1997, before operation of the Temperature Control Device (TCD) at Shasta Dam (See Response to Comments Water Management Feasibility Study and Addendum, Volume 2 of 5, *Technical Memorandum, Metal Concentration in Spring Creek Powerhouse and Shasta Dam Releases*, page 2-558 prepared by John Spitzley, CH2M HILL for Rick Sugarek, U.S. EPA). Further, a single average value ignores the seasonal variation in the data that has increased over the past four years. The range of copper concentrations exiting the dam after installation and operation of the TCD appear to have increased. This appears to be due to the inadvertent effect of the TCD drawing water from an interval within the lake that contains higher copper concentrations in the winter months than that prior to installation of the TCD.

MRRC, the owners of the mines in the West Squaw Creek and Little Backbone Creek drainages, plan on moving their activities to what are currently the largest sources of ARD to Shasta Lake, those abandoned copper mines in the Little Backbone Creek watershed. If similar reductions in metal loadings can be achieved in Little Backbone Creek, then metals in Shasta Lake will be greatly reduced.

Page 1, last paragraph

The RWQCB's reports should disclose what downstream impacts may be expected to occur if the Basin Plan metals standards are relaxed for West Squaw Creek. Also, if the

proposed amendment is approved it may negatively affect Reclamation in several ways. Agency reports should address the impacts for:

- *Operations of the Shasta Dam temperature control device;*
- *Operations at Iron Mountain Mine including dilution with Shasta Lake water including dilution of SPDD acid mine drainage (AMD) with Shasta Lake water;*
- *Total maximum daily load metal allocations for the Sacramento River;*
- *Ability to meet Basin Plan objective of water quality;*
- *Overall operations of Reclamation's Central Valley Project.*

The proposed amendments to the Basin Plan will not result in any increases of metal loading to Shasta Lake or the Sacramento River. The proposed amendments simply recognize that West Squaw Creek will not, in the foreseeable future support fish and other metal and pH sensitive aquatic species. The Water Quality Objectives for cadmium, copper, and zinc for protection of sensitive species is being modified to reflect the reality that metal concentrations in West Squaw Creek between the Early Bird Tributary and Shasta Lake cannot be reduced to the levels that are protective of these species.

Since there will be no increases in metal loadings to Shasta Lake due to the proposed amendments, there will be no adverse impacts to the current operations at Shasta Dam. However, the proposed amendments will allow MRRC, the owners of the mines in the West Squaw Creek and Little Backbone Creek watersheds, to better allocate their resources to other, larger sources of acid rock drainage (ARD) entering Shasta Lake from Little Backbone Creek.

This potential reduction in metal loading to Shasta Lake is supported by data from monitoring reports submitted by Millennium Holdings Inc. (owners of Bully Hill and Rising Star Mines on Horse Creek and Town Creek), MRRC (owners of the mines on West Squaw Creek and Little Backbone Creek) and discharge data from Shasta Dam provided by the Bureau of Reclamation. The current average metal loading to Shasta Lake is as follows: Town Creek 7.6 lbs/day, Horse Creek 10.1 lbs/day, West Squaw Creek, 18.2 lbs/day, Little Backbone Creek 69.6 lbs/day, Total 105.5 lbs/day. Discharge from Shasta Dam averages 91.7 lb/day. As the data shows, Little Backbone Creek is the largest remaining source of ARD to Shasta Lake. Focusing remedial efforts in this watershed has the potential for the greatest reduction of metal loading in Shasta Lake and the Upper Sacramento River with positive affects on Bureau of Reclamation operations. A table with the metal loading from each watershed will be included in the Staff Report.

Page 2, 1st paragraph

Reclamation operates its facilities to meet a complex array of environmental and human needs, most of which are regulated by law. Amending the Basin Plan may have serious impacts to the way Reclamation operates. Reclamation should not be penalized for, or made responsible for, mining operation affects on Shasta Lake waters simply because Reclamation operates a dam at Shasta. The perception is that approval of this proposed amendment will in effect make Reclamation responsible for managing water quality for the entire Shasta Lake area, allowing the landowners of the pollution sources to benefit by allowing them to minimize efforts for controlling pollution sources. Reclamation feels if this amendment is passed that it will open the door for additional mine owners to apply for similar amendments exempting them from applying Best Available Technology and Best Management Practices.

There is no mention or reference to the Bureau of Reclamation being responsible for “mining operations affects on Shasta Lake” in the Draft Staff Report, Draft UAA, or proposed Basin Plan amendments. The Regional Board recognizes the responsibility for the discharges of ARD to Shasta Lake belong to the mine owners.

The proposed amendments do not allow the owners of the abandoned mines to “minimize their efforts for controlling pollution sources” As stated in the draft Staff Report, Section 1.1.3, Purpose and Need for the Proposed Revisions To The Basin Plan, page 5, first full paragraph, MRRC will remain responsible for monitoring and maintaining the existing remedial facilities, complying with NPDES permits to protect remaining designated beneficial uses in West Squaw Creek and the uses of downstream water bodies, and implementing BMPs as technology and methodologies become available.

The Regional Board will continue to hold the mine owners responsible for the discharges of ARD to West Squaw Creek. To emphasize the Regional Board’s commitment towards requiring the mine owners to maintain or improve the current water quality in West Squaw Creek, the Resolution before the Regional Board for adoption of the proposed Basin Plan Amendments includes the following Finding:

“WHEREAS, the NPDES permit for MRRC will be revised to include a maximum mass metal loading limit at the mouth of West Squaw Creek to assure the current remedial measures remain effective and assure no backsliding of water quality, and the permit will contain language to assure that as new Best Management Practices are developed, MRRC will be required to implement these practices to continue to reduce metal loading to West Squaw Creek”

Finally, if owners of other mines that discharge ARD to surface waters can meet the discharge conditions of their NPDES permits i.e. remove 99 percent of metal loading from point source discharges and implement available Best Management Practices towards the remaining non-point sources, and can convince the Regional Board that the watercourse will not support designated, but not existing beneficial uses in the foreseeable future, they have the right, by law, to request a change in the Basin Plan to

eliminate those unattainable uses. However does not mean they will be unregulated or be allowed to “minimize” their efforts.

Regional Board Response to Comments on Attachment to April 22 Letter from U.S. Bureau of Reclamation (Reclamation), *Comments for Regional Board Hearing April 22, 2004*

Item 1, page 1

Reclamation disagrees with Regional Board statements that the proposed Basin Plan Amendment will "not impact any operations at Reclamation Central Valley Project operations". It is clear that the existing discharges from West Squaw Creek (WSC) and Little Backbone Creek do impact Central Valley Project operations that must comply with the Basin Plan water quality objectives in the Sacramento River below Keswick Dam.

Regional Board Staff agrees that the existing discharges from West Squaw Creek and Little Backbone Creek impact Central Valley Project operations. However, that is not the issue under consideration. The issue is the proposed changes in the Basin Plan to limit the definition of the beneficial use of Freshwater Habitat to exclude "fish or other metal and pH sensitive aquatic species in West Squaw Creek from Early Bird Tributary to Shasta Lake" and to limit the geographic extent of the Water Quality Objectives for cadmium, copper, and zinc to not include West Squaw Creek from the Early Bird Tributary to Shasta Lake. The proposed amendments will not result in an increase in metal loading to Shasta Lake and may even result in a significant reduction as discussed in Regional Board Response to Comments Page 1, last paragraph, above. Regional Board staff has determined that there is little future reductions in metal loading to be realized at West Squaw Creek due to the remaining diffuse non-point sources which are impossible to locate and control.

Item 2, page 1

The current level of discharges from WSC and Little Backbone Creek cause exceedances of the dissolved copper concentration at Shasta Dam that is specified as a target concentration in the Total Maximum Daily Load (TMDL) for the Upper Sacramento River. The existing level of controls is clearly not adequate. The Regional Board stated its intent to develop a TMDL for Shasta Lake to develop a control program for the discharges from the mines in WSC and Little Backbone Creek and other areas to meet the dissolved copper requirement. The Shasta Lake TMDL should be developed prior to any Regional Board action to remove beneficial uses for WSC.

Regional Board staff agrees that discharges of dissolved copper from Shasta Dam exceed the average goal presented in the TMDL for the Upper Sacramento River. The source of the copper includes not only discharges from West Squaw Creek and Little Backbone Creek, but Horse Creek and Town Creek. Regional Board staff also agrees further

remediation of ARD discharges to Shasta Lake are required. See Regional Board Response to Comments on Reclamation April 22, 2004 letter Page 1, 3rd paragraph above.

Item 3, page 1.

The Regional Board bases its proposed WSC decision in part on an expectation that greater reductions in metal load can be achieved by controlling sources in Little Backbone Creek. The Regional Board has not documented this expectation. A TMDL for Shasta Lake would be the appropriate means to analyze and document the feasibility of this approach. Reclamation's review indicates that the sources remaining to be controlled in Little Backbone Creek will be difficult challenges.

See Regional Board Response to Comments on Reclamation April 22, 2004 letter, Page 1, last paragraph above.

Item 4, page 1.

MRRC has not yet completed implementation of its remedial program to implement BAT on all point sources, and BMP for non-point sources. Work is expected to be ongoing, perhaps for the next two years. Data also needs to be collected to demonstrate compliance with the NPDES permit which requires a 99 percent reduction from point sources. MRRC's remedial program is not at a point where consideration of a Use Attainability Analysis (UAA) is appropriate. The proposed Regional Board action is premature.

Even with the work proposed for this summer by MRRC in the West Squaw Creek Drainage, the copper concentrations will still be too high to support fish and other pH and metal sensitive species. The tables containing pre and post remedy data are contained in the Water Quality Appendix of the UAA as summarized in Tables 2, 3, and 4 of the Appendix and in Tables 2-3, 2-4, and 2-5 of the UAA. These tables contain information on point and non-point sources of ARD and achieved and expected reductions. There are few significant controllable sources of ARD remaining. As the tables indicate, even with the anticipated controls implemented, copper loading will still be 16 pounds per day. Assuming that the average annual flow rate at the West Squaw Creek Bridge is 25,000 gpm (see Water Quality Appendix of the UAA), this would yield an average dissolved copper concentration of 50 ug/l. The Staff Report will be modified to reference these tables.

Item 5, page 1 and 2.

Reclamation believes that Best Available Technology (BAT) and Best Management Practice (BMP) technologies are currently available. MRRC does not propose to implement these technologies as part of its remedial program, although doing so could further reduce metal loads discharged into Shasta Lake. What assurance is there that new BMPs will be implemented when old and current ones have not been put in place due to cost or remoteness of the site? What water quality objectives will be the goal of the future BMPs? Will it be 1000 ug/L for domestic and municipal uses? If 1000 ug/L is the target where are the incentives to implement any BMPs since the water coming off WSC is currently well below 1000 ug/L? The CWA requires implementation of reasonable and effective BMPs. Reclamation feels that this has not been adequately addressed. It is premature to apply for an amendment until all reasonable and effective BMPs have been implemented.

Regional Board staff, after extensive review and involvement in the remedial activities at the West Squaw Creek mines, has determined that, aside from the few remaining point source discharges that will be addressed this summer and summarized in Tables 2-3, 2-4, and 2-5 of the UAA, the remaining sources of ARD are diffuse and impossible to locate and treat and that all “reasonable and effective BMPs” will have been implemented. At the conclusion of the summer of 2004, the remedial activities at West Squaw Creek will have achieved percentage reductions in metal loading comparable as those achieved by the U.S. EPA at Iron Mountain Mine.

Regulation of discharges of ARD in the West Squaw Creek watershed will remain under a NPDES permit, which requires implementation and maintenance of the remedial facilities. This is the same mechanism that has driven the remedial activities to date.

The Water Quality Objectives that will be applicable to West Squaw Creek will **not** be relaxed to the 1,000 ug/l for copper that is applicable to the protection of domestic and municipal water supply. The regulatory standards that will apply to West Squaw Creek will prevent backsliding from the water quality that currently exists (after implementation of the activities scheduled for this summer).

If the Basin Plan is amended as proposed, the following water quality standards for the protection of the existing uses of West Squaw Creek will continue to apply:

Federal Policy

Federal Antidegradation policy (40 CFR 131.12), which states, in part:

“The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

- (1) Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.”

California Toxics Rule: Those CTR criteria that apply to the remaining designated beneficial uses. Because the proposed Basin Plan Amendments do not include the protection of “fish and other pH and metal sensitive species”, CTR objectives for protection of sensitive aquatic organisms do not apply.

State and Regional Water Board Policies: These policies and others would require the Regional Board to require, at a minimum, that dischargers into West Squaw Creek continue to maintain existing management practices.

State Water Board Resolution No. 68-16, Statement of Policy with
Respect to Maintaining High Quality of Water in California

State Water Board Resolution No. 88-63, Sources of Drinking Water Policy

State Water Board Resolution No. 90-67, Pollutant Policy Document

Non-point Source Management Plan

Basin Plan Controllable Factors Policy

Basin Plan Antidegradation Implementation Policy

Seasonal numeric mass loading limits will be developed that reflect the current water quality in West Squaw Creek and included in the NPDES permit for West Squaw Creek.

Item 6, page 2

The Regional Board proposes to include a statement in the Regional Board Resolution that "the NPDES permit for MRRC will be revised to include a maximum metal loading limit at the mouth of West Squaw Creek to assure the current remedial measures remain effective and current metal reductions are maintained ..." First, the existing metal discharges in WSC need to be further reduced. High metal concentrations in Shasta Lake are a current problem and need to be addressed. Second, it is unclear how this proposed requirement will be monitored and enforced. Requirements for quarterly monitoring in the current NPDES permit are inadequate for determining the actual metal loads discharging from WSC. Weekly sampling conducted over a period of years, or more frequent sampling over a shorter period, would be required to characterize the metal loads discharging from WSC. It is unclear how the Regional Board would be able to interpret the data to take enforcement actions necessary to assure proper operation and maintenance of existing controls. MRRC currently has a NPDES permit (number CA0081876) and is in violation of that permit, but wording in part 23 of the permit has allowed them to "remove or modify a designated beneficial use". So not only is the

company in violation without penalty, the company is allowed to apply for a means in which it will not be held liable for the initial permit requirements. If the proposed beneficial uses is removed for WSC and a new NPDES permit is issued; what regulatory authority will there be to "reduce discharges from point and non-point sources"? The concern is: with only the beneficial uses for municipal and domestic water supply the maximum concentrations for copper change from 5.6 ug/L (Basin Plan) to 1000 ug/L. Will this be the new maximum concentration MRRC will need to obtain? Is there another number the Regional Board will set for MRRC only? Will this number be based on data collected from WSC? What regulatory authority will there be to set a number below 1000 ug/L?

Regional Board staff agrees that the high metal concentrations in Shasta Lake are a current problem and need to be addressed. Staff has issued NPDES permits and Cease and Desist Orders to the owners of the mines discharging metal laden ARD into drainages that enter Shasta Lake. The NPDES permits and Cease and Desist Orders have been effective in significantly reducing metal loading to Shasta Lake, including West Squaw Creek. In an effort to comply with the various permits and orders, extensive work is planned for this summer at the Bully Hill and Rising Star Mines draining into Town Creek and Horse Creek, respectively, as well as further work in West Squaw Creek. As noted in Regional Board Response To Comments Page 1, Last Paragraph above, extensive efforts are planned for Little Backbone Creek, currently the largest source of ARD entering Shasta Lake, in the future.

MRRC is not "in violation without penalty". The issuance of a Cease and Desist Order by the Regional Board is consistent with the State Water Resources Control Board Enforcement Policy. This Order has been effective in directing the mine owners to implement applicable and reasonable remedial activities to reduce metal loading to Shasta Lake.

As described in Regional Board Response to Comments Item No. 5 above, the regulatory mechanism for requiring continued implementation and maintenance of the remedial facilities remains the NPDES permit. The regulatory authority for requiring lower metal concentrations in West Squaw Creek than the 1,000 ug/l for protection of domestic and municipal water supply are those policies and regulations described in our response to Item 5 above.

Item 7, page 2

The Regional Board proposes to include a statement in the Regional Board Resolution that the NPDES permit for MRRC will be revised to "assure that as new BMPs are developed, MRRC will be required to implement these practices to continue to reduce metal loading to WSC". It is unclear how the Regional Board will have the regulatory authority to require the implementation of additional BMPs at a future date. The

Regional Board's proposed approach appears to eliminate all effective regulatory drivers that could achieve further reductions in the WSC metal discharges.

See Regional Board Response to Comments, Item 5 above.

Item 8, page 2

Reclamation does not see an advantage to and will not be reconfiguring the 70 million dollar TCD. This is an issue that the Regional Board needs to address prior to amending the Basin Plan to remove certain beneficial uses from WSC.

The proposed Basin Plan Amendments and associated documents are not intended to instruct the Bureau of Reclamation on how to operate the TCD. Regional Board staff, in following through on the TMDL for the Upper Sacramento River, has conducted extensive, depth discrete sampling of Shasta Lake, including sampling near Shasta Dam. The results of the sampling are contained in the report titled *Interim Report, Metals Distribution Within Shasta Lake, Shasta County, California*, (May 2003) was issued and copies sent to the Bureau of Reclamation. The data suggest that the operation of the TCD may have some seasonal affect on the concentration of metals discharging from Shasta Dam. We have provided this information to the Bureau of Reclamation which they might find useful in reducing the amount of water required to be released from storage to meet dilution criteria for discharges from Iron Mountain Mine.

Item 9, page 3

Reclamation does recognize there are other sources of metal loading to Shasta Lake in fact it is a concern that these other sources will be able to remove beneficial uses and amend the Basin Plan which will greatly affect the overall water quality of the entire lake. The fact that Little Backbone Creek, "the largest contributor" to metal loading is owned by MRRC is of concern to Reclamation. If this Basin Plan amendment is passed, what will prevent MRRC from applying for and attaining an amendment to the Basin Plan for Little Backbone Creek? Removing the proposed beneficial uses from Little Backbone Creek would be the logical next step for MRRC should the current proposal be adopted.

Only the Regional Board can designate beneficial uses to a waterbody, and this is done only by complying and following applicable federal and state laws and regulations. The bar for modifying or removing designated, but not existing, beneficial uses from a water body is high. If the Regional Board is convinced that all practical remedial activities have been undertaken and a water body is still unable to meet the Water Quality Objectives for support of a designated, but not existing beneficial use, and the Regional Board determines that the beneficial use has not existed and will not exist in the

foreseeable future, then such modifications to the Basin Plan may be appropriate. However, any such discussion relating to Little Backbone Creek is premature and years away, if at all.

Item 10, page 3

*Questions raised by the data presented in the UAA are: What **QA/QC** measures were used? What methods were used for collecting the samples? What level of training does the staff collecting the samples have? What methods were used by the lab(s) for analyses? How were the sampling sites determined How were the frequencies of sampling determined? The UAA contains insufficient data to make the determination that WSC will not "support a fishery or spawning in the affected areas". There is inadequate data to make a determination that no further improvements at WSC can be made. Despite this the data show the metal levels decrease significantly each year. If these data are reliable one can conclude that further metal reductions can be made.*

Samples relating to the West Squaw Creek UAA have been taken over many years by many different individuals with several agencies and companies including staff with the Dept of Fish and Game, Regional Board, and MRRC. All this information has been entered into a comprehensive database and used in the UAA.

MRRC follows requirements for sampling and analyses similar to those for any holder of a NPDES permit holder as required by the Regional Board. Further sampling activities are required in their Cease and Desist Order. The sampling and analyses procedures are described in the document titled *Sampling, Analysis and Quality Assurance Plan, West Squaw Creek, Keystone, Balaklala, Shasta King, and Early Bird Mines, Shasta County California*, March 2000. Compliance samples taken by MRRC and samples taken by the Regional Board are analyzed at a laboratory certified by the State of California for hazardous waste analyses.

In reviewing all the available data, Regional Board staff has determined that there is more than sufficient data to support the conclusions set forth in the UAA. While the UAA does not contain a full primer on how to address ARD, it does contain sufficient documentation for technical staff to make an informed decision.

Further, simply noting that metal reductions have occurred in the past does not mean similar reductions can occur in the future. This is an over simplification of actual conditions experienced in the West Squaw Creek Watershed. After activities are completed this summer, further remedial activities will only have minimal reductions in metal loading. MRRC and the Regional Board will continue efforts in West Squaw Creek to reduce metal loading as appropriate; however, even with these efforts, the UAA provides adequate information to determine the watercourse will not support fish and other pH and metal aquatic sensitive species in the foreseeable future.

